GV-LPR

License Plate Recognition

User Manual

V2.1.3

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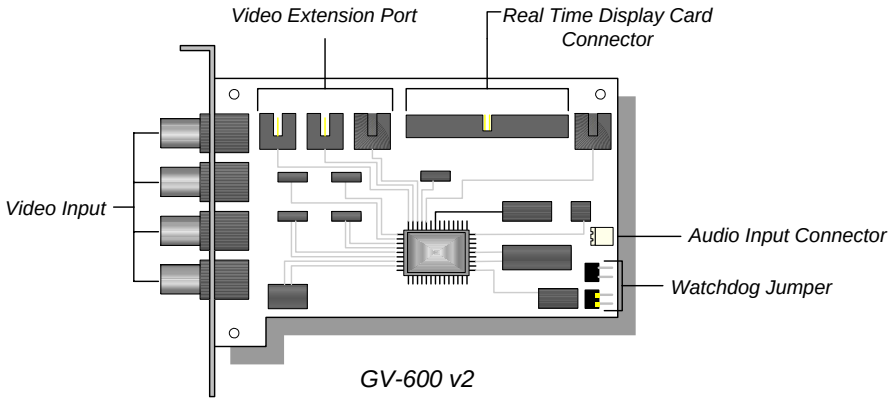
CHAPTER 1

Hardware Installation

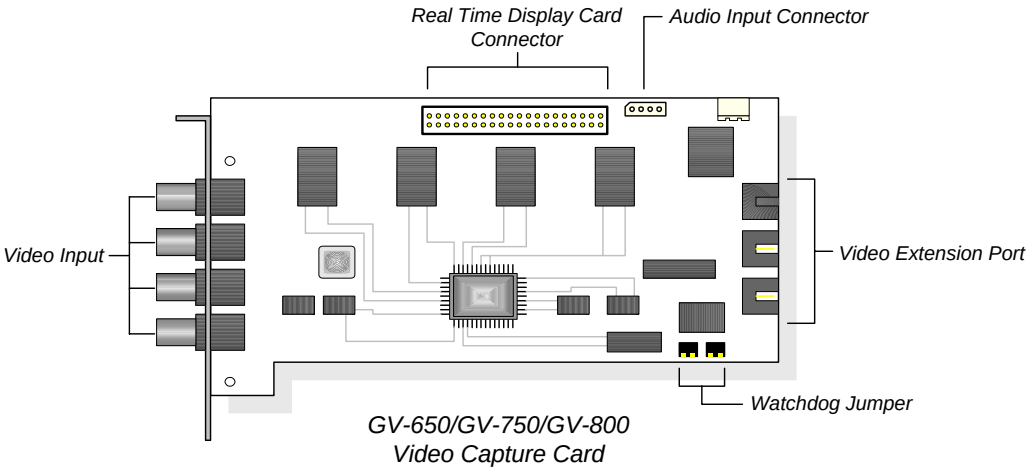
The Hardware components included in your system may vary depending on the model or optional features you purchased. This chapter will describe all available hardware components of the GV-LPR system and its installation procedures.

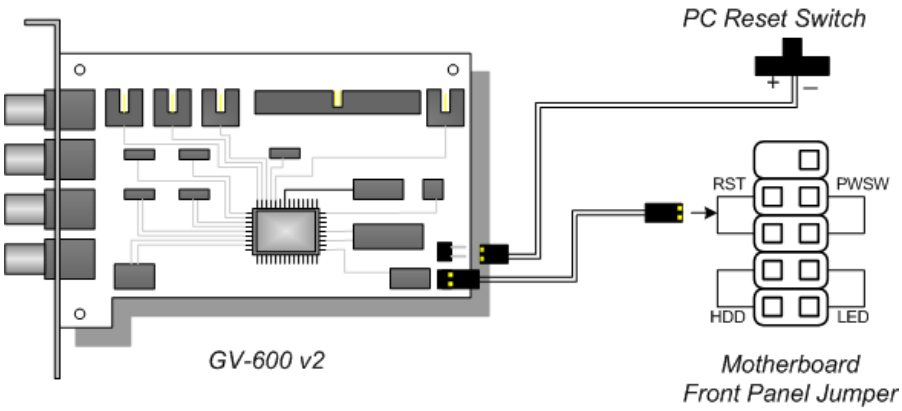
1.1 Installation of Video Capture Card

1. Power-off the PC.
2. Insert PCI card into PCI slots.
3. Connect the Hardware Watchdog line.
4. Connect the video camera signal lines.
5. Turn on PC power. Windows will automatically detect the existing cards. Ignore the wizard window and keep on the following step.
6. Select the driver path in the CD directory **\Driver**, run DrvInst.exe to install the driver.



GV-600 v2





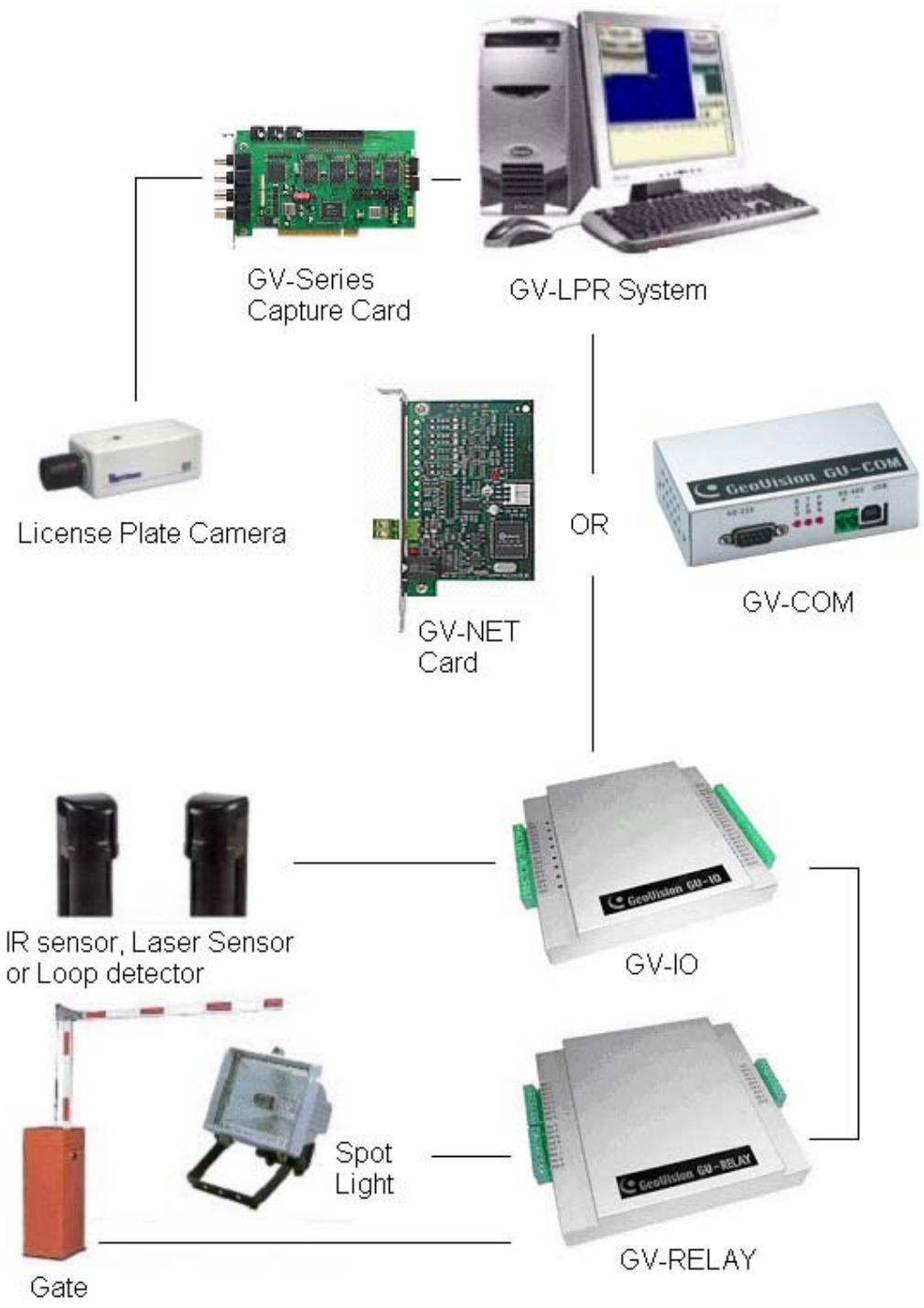
Connection of Hardware Watchdog

1.2 Installation of Key-pro

The Key-pro is a 4.7 cm x 2 cm x 0.9 cm blue color USB plug-in key. It can be used for the USB port that supports USB 1.1 or above. Please plug in the Key-pro in the USB port before lunching the GV-LPR system. The Key-pro for 1, 2, 4, 6 and 8 lanes are different. Without the Key-pro the system cannot be run.

1.3 Installation of the I/O Module

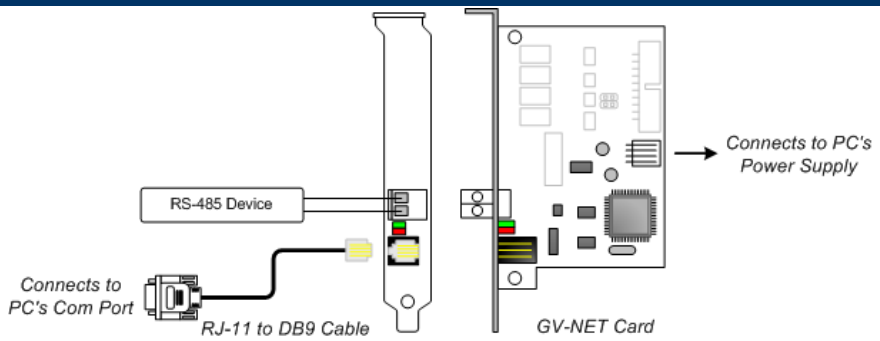
GV-LPR supports I/O detection mode so that sensors can trigger the GV-LPR to do recognition. This section describes the installation of the I/O modules.



1.3.1 Install GV-NET Card

The GV-NET Card is an interface converter, which converts RS-232 to RS485. It should be installed inside a PC.

Specifications		
RS-232 to PC	RJ-11 to DB9 female cable	
RS-485 +	Connect to GV-IO RS-485+	
RS-485 -	Connect to GV-IO RS-485 -	
Communication	RS-485, 1,200~19,200 bps	
DC IN	DC 5V, 1A	
Environmental Conditions	Operation temperature	0~50 degree C
	Humidity	5%~95% (non-condensing)
Compatible Models	GV-NET Card: all models	
Dimensions	88mm x 99mm	



1.3.2 Install GV-COM

GV-COM is a device that converts USB to RS-485 or RS-232. It is to be connected to the USB of your computer.

Specifications		
Serial Interface	RS-232	Signal: DCD, RxD, TxD, DTR, GND, DSR, RTS, CTS
		Connecter: DB9 Male
	RS-485	Signal: D+, D
		Connector: Terminal Block
	16 KV ESD for All Signals	Serial Line Protection
USB	Compliance	USB 1.1, 1.0
		USB 2.0 Backward Compatible
	Speed	Full speed 12 Mbps
Communication Parameters	Parity	None, Even, Odd
	Data Bit	7, 8
	Stop Bit	1 (default), 2
	Flow Control	RTS/CTS, XON/XOFF
	Speed	600 bps to 115,200 bps
Environmental Conditions	Operation Temperature	0°C~55°C
	Humidity	5%~95% (Non-Condensing)
Dimensions	103 (W) x 32 (H) x 64 (D) mm	

1.3.3 Install GV-I/O

The GV-IO is an 8 points digital input and 16 point digital output controller. The dry relay contacts provide an interface to your external devices such as sensors or detectors. You may use the Normal Open or Common Connection Point, connect to the GND and IN1~8 of GV-IO respectively. Despite the connection of the lines, you should also setup in the I/O Setup of the GV-LPR software.

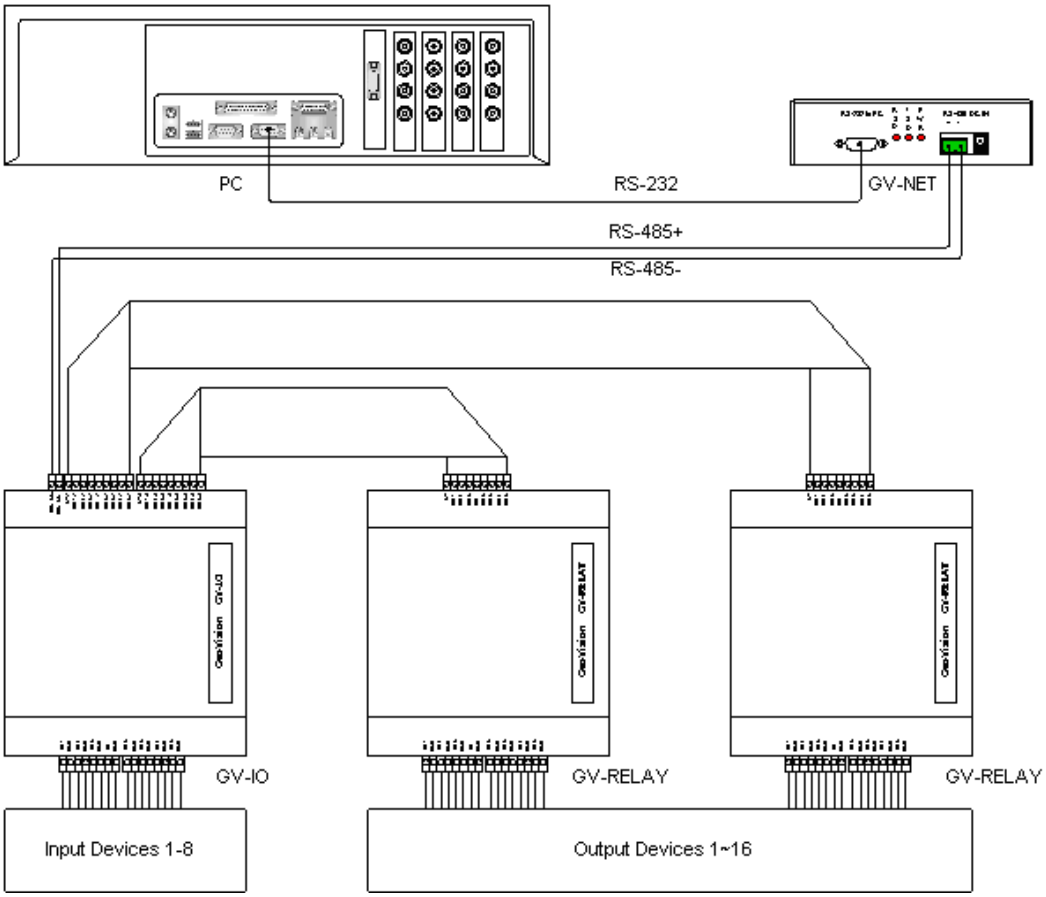
Specification		
INPUT	Input	8
	Input Signal	0-5 V DC (floating)
	High State	5V
	Low State	0V
	Wiring Label	GND, DI 1~DI 8
OUTPUT	Output	16
	Output Circuit	TTL Open Collect
	Wiring Label	+5V-1, DO 1-1 ~ DO 8-1
		+5V-2, DO1-2 ~ DO 8-2
Communication	RS485, 9600 bps	
RS-485+	Connect to GV-NET RS-485+	
RS-485-	Connect to GV-NET RS-485-	
DC IN	Power Adapter DC 5V, 2A Inner Positive	
Environmental Condition	Operation temperature	0~50 degree C
	Humidity	5%~95% (non-condensing)
Dimension	202(W) x 166(H) x 39(D) mm	

1.3.4 Install GV-RELAY

The GV-RELAY is a relay output module with 8 points relay output interface. This device is to actually control the gate, light or alarm and connects to the control source of GV-IO output. Despite the connection of the lines, you should also setup in the I/O Setup of the GV-LPR software.

Specification	
Relay Output	RL1~RL8
Relay Control Source	+5V, DO1~DO8 connect Output of GV-IO
Relay Status	Normal Open
Relay Capacitance	P6A / 250V AC; 10A / 125V AC; 5A / 28V DC
Relay ON Time	8ms
Relay Off Time	5ms
Dimension	202(W) x 166(H) x 39(D) mm

Please refer to the diagram below for the connection of the GV-NET, GV-IO and GV-RELAY. The GV-NET can be replaced by the GV-NET Card.



Connection of GV-IO and GV-RELAY

CHAPTER

2

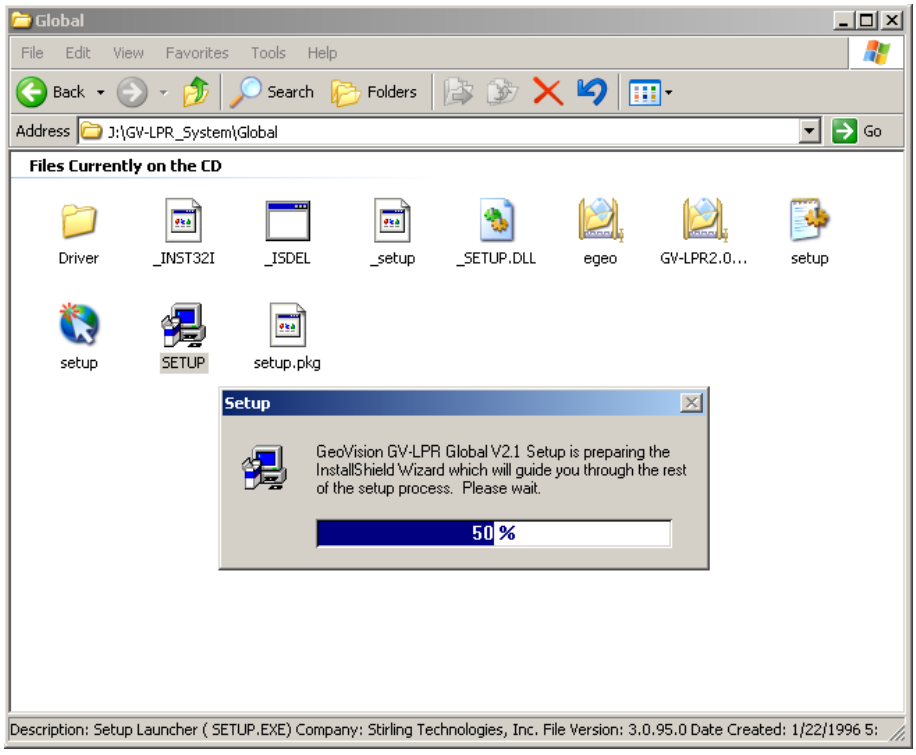
Software Installation

All GV-LPR software applications and the drivers for the GV-Series capture cards are included in the CD provided within the system package. Please also refer to the images and videos within the CD as a reference for your installation.

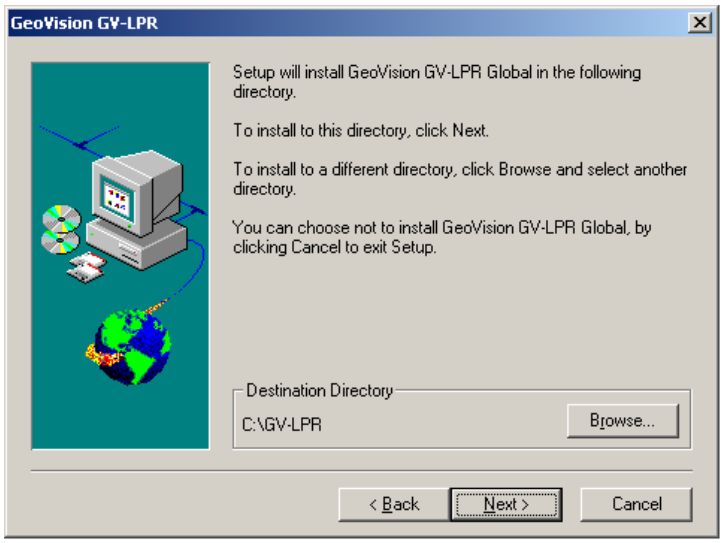
2.1 Install GV-LPR Application

Before starting the installation of GV-LPR, you should check if all the hardware components were installed properly. It is important that you complete the hardware installation in Chapter one first before proceeds to the software installation procedures below.

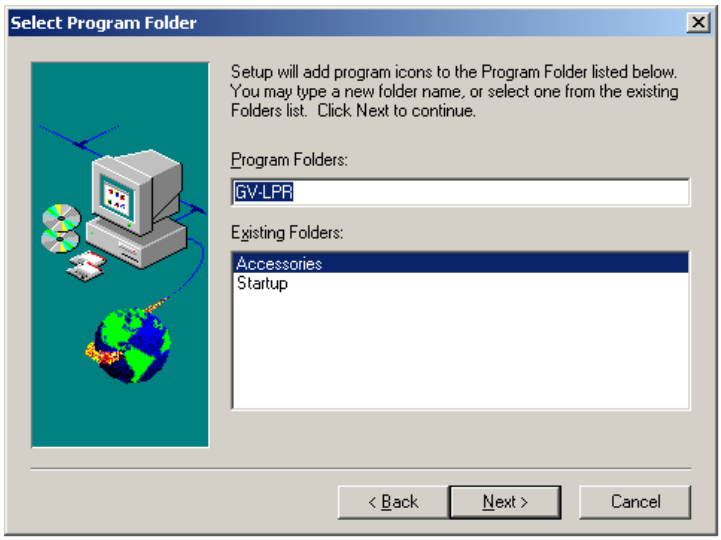
1. Insert GV-LPR CD into the CD-ROM drive of your PC. Please change to the folder of “Setup” and run “Setup.exe”.



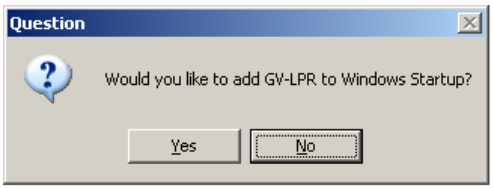
2. Click [Browse] if you wish to specify another destination directory otherwise click [Next] to proceed to the next step.


GeoVision GV-LPR
Setup will install GeoVision GV-LPR Global in the following directory.
To install to this directory, click Next.
To install to a different directory, click Browse and select another directory.
You can choose not to install GeoVision GV-LPR Global, by clicking Cancel to exit Setup.
Destination Directory
C:\GV-LPR
Browse...
< Back
Next >
Cancel

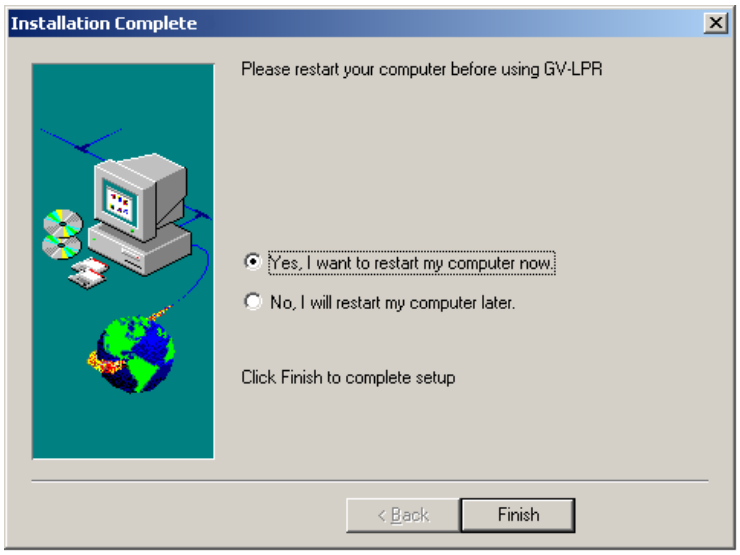
3. In the select program dialog box you may change the name for your GV-LPR folder in the empty text column under Program Folders. If you are not going to do any modification, simply click [Next] and the installation will start. Follow the rest of the instruction to complete the installation.


Select Program Folder
Setup will add program icons to the Program Folder listed below. You may type a new folder name, or select one from the existing Folders list. Click Next to continue.
Program Folders:
GV-LPR
Existing Folders:
Accessories
Startup
< Back
Next >
Cancel

4. Select whether you want to add it to the Startup so that the GV-LPR auto starts running when the PC is power on. It is suggested to select “yes”.



5. Finish the setup process. You may select to restart the computer immediately or later. It is recommended to restart the computer before running GV-LPR application.

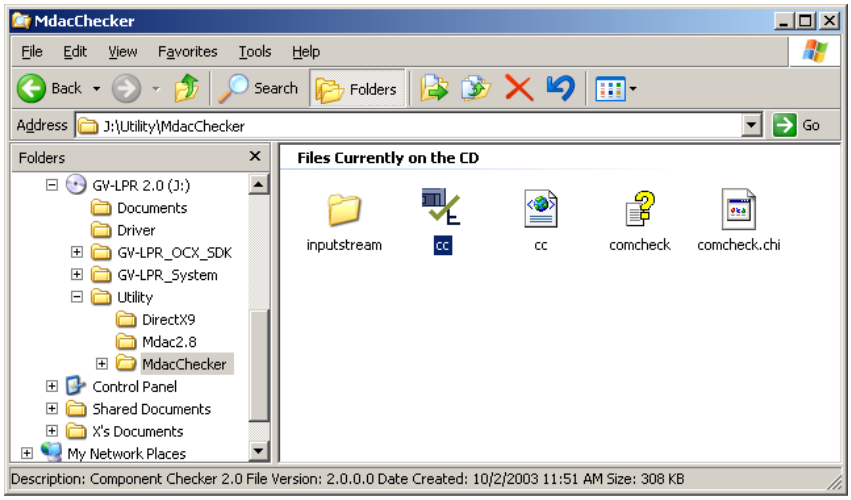

Installation Complete
Please restart your computer before using GV-LPR
Yes, I want to restart my computer now.
No, I will restart my computer later.
Click Finish to complete setup
< Back
Finish

2.2 Install Microsoft Data Access Components (MDAC)

Since GV-LPR uses Microsoft Data Access Components (MDAC) version 2.7 or above, please check if your system has install MDAC before running GV-LPR application. The MDAC checker and installer are included in “Utility” folder of the install CD.

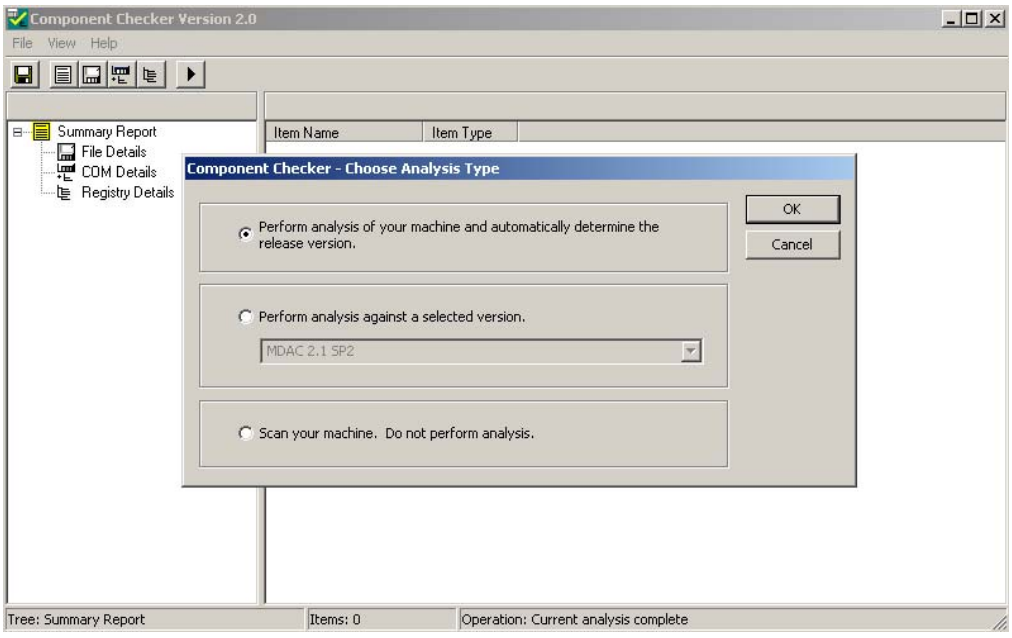
2.2.1 Check the version of MDAC

1. Please select the folder of “Utility” and then “MdacChecker” from the install CD.

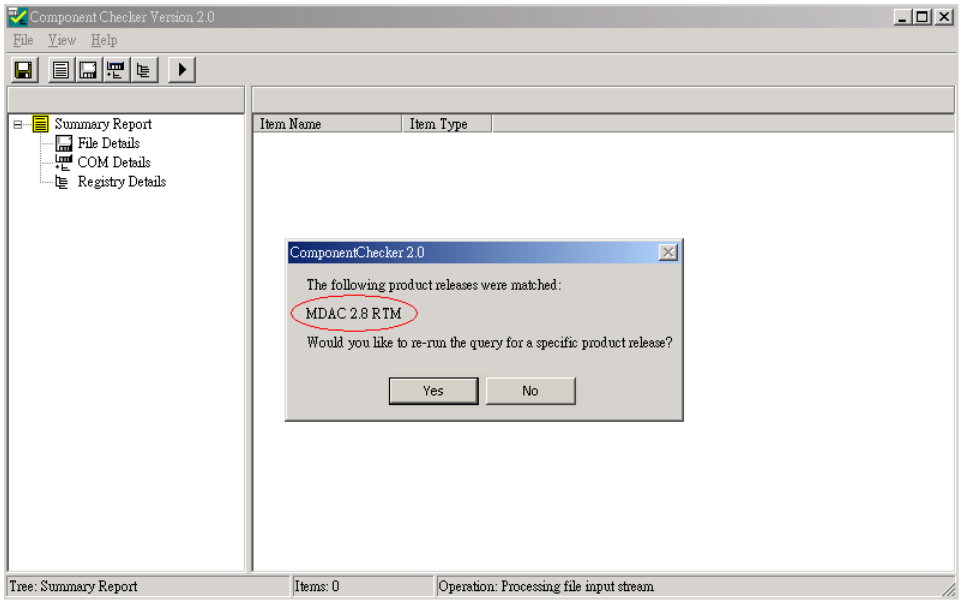


2. Run the “cc.exe”.

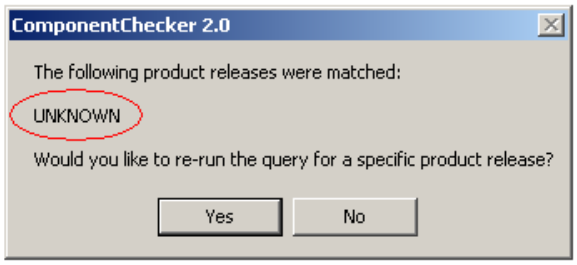
3. Please select “Perform analysis of your machine and automatically determine the release version” and press “OK”.

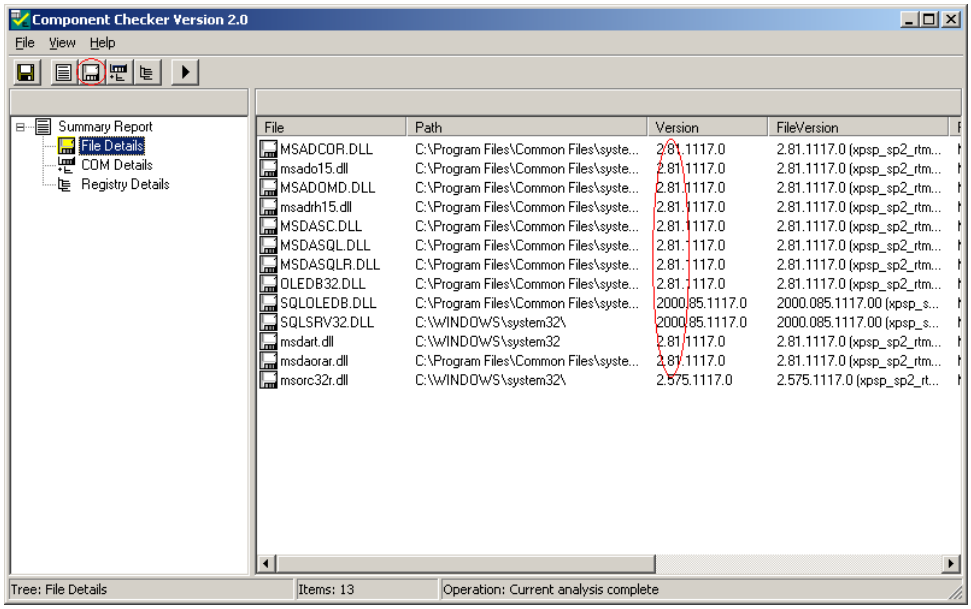


4. The program will auto detect your MDAC version.



5. If the version is unknown, you may select “View” and then “File Detail” to view the version of MDAC.

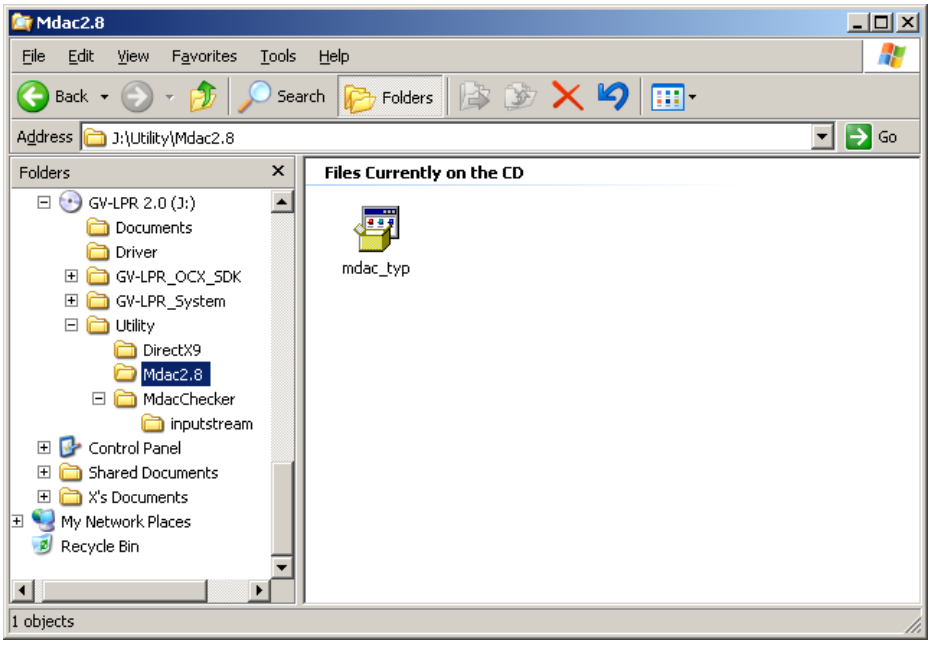



Component Checker Version 2.0
File View Help
Summary Report
File Details
COM Details
Registry Details
File
Path
Version
FileVersion
MSADCOR.DLL C:\Program Files\Common Files\syste... 2.81.1117.0 2.81.1117.0 (xpsp_sp2_rtm...
msado15.dll C:\Program Files\Common Files\syste... 2.81.1117.0 2.81.1117.0 (xpsp_sp2_rtm...
MSADOMD.DLL C:\Program Files\Common Files\syste... 2.81.1117.0 2.81.1117.0 (xpsp_sp2_rtm...
msadrh15.dll C:\Program Files\Common Files\syste... 2.81.1117.0 2.81.1117.0 (xpsp_sp2_rtm...
MSDASC.DLL C:\Program Files\Common Files\syste... 2.81.1117.0 2.81.1117.0 (xpsp_sp2_rtm...
MSDASQL.DLL C:\Program Files\Common Files\syste... 2.81.1117.0 2.81.1117.0 (xpsp_sp2_rtm...
MSDASQLR.DLL C:\Program Files\Common Files\syste... 2.81.1117.0 2.81.1117.0 (xpsp_sp2_rtm...
OLEDB32.DLL C:\Program Files\Common Files\syste... 2.81.1117.0 2.81.1117.0 (xpsp_sp2_rtm...
SQLOLEDB.DLL C:\Program Files\Common Files\syste... 2000.85.1117.0 2000.085.1117.00 (xpsp_s...
SQLSRV32.DLL C:\WINDOWS\system32\ 2000.85.1117.0 2000.085.1117.00 (xpsp_s...
msdart.dll C:\WINDOWS\system32 2.81.1117.0 2.81.1117.0 (xpsp_sp2_rtm...
msdaorar.dll C:\Program Files\Common Files\syste... 2.81.1117.0 2.81.1117.0 (xpsp_sp2_rtm...
msorc32r.dll C:\WINDOWS\system32\ 2.575.1117.0 2.575.1117.0 (xpsp_sp2_rt...
Tree: File Details
Items: 13
Operation: Current analysis complete

6. If the version is 2.7 or upper, you may skip the next section for install MDAC. Else, you should follow the instruction of next section to install MDAC.

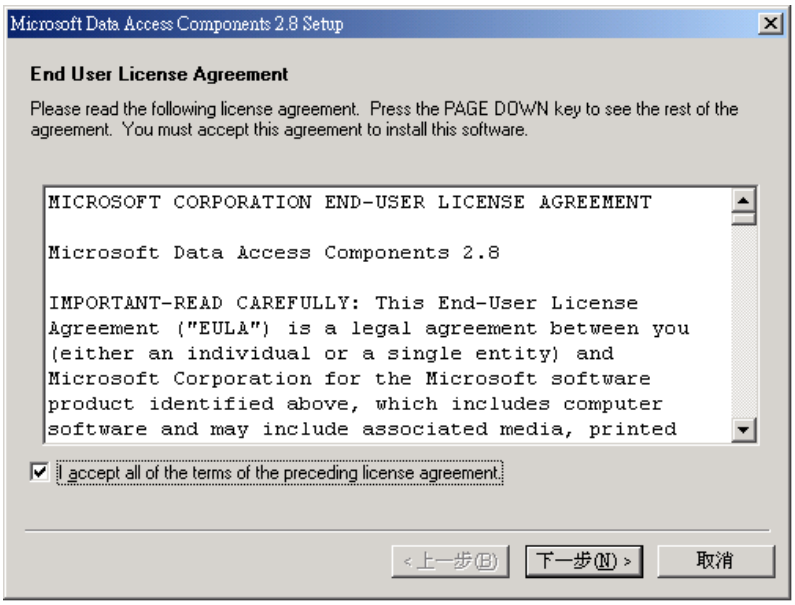
2.2.2 Install MDAC

1. Please select the folder of “Utility” and then “Mdac2.8” from the install CD.

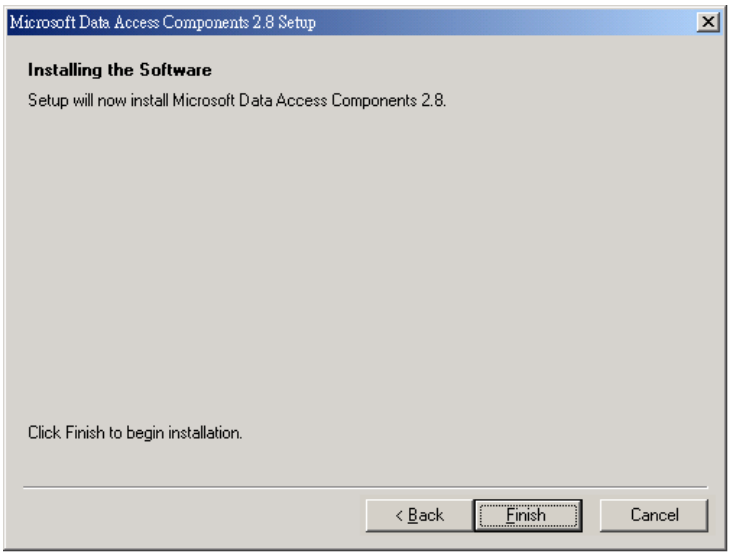


2. Run “mdac_typ.exe”

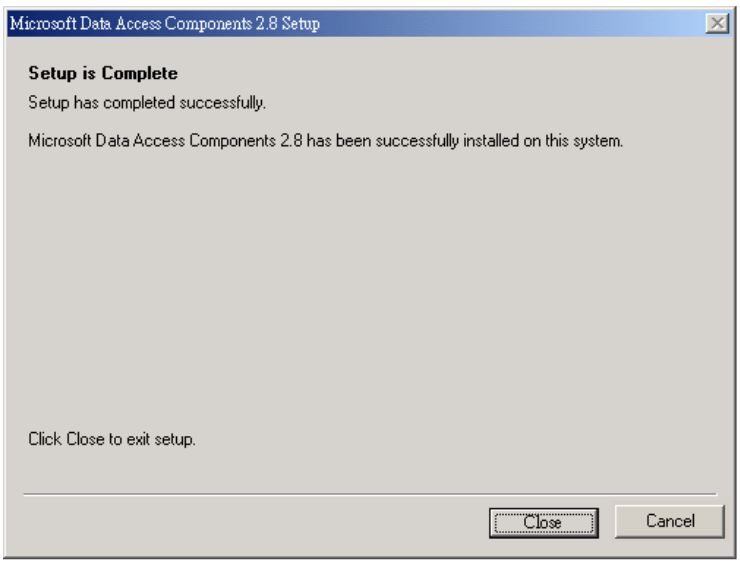
3. Please select “I accept all of the terms of the preceding license agreement” and press “Next”.


Microsoft Data Access Components 2.8 Setup
End User License Agreement
Please read the following license agreement. Press the PAGE DOWN key to see the rest of the agreement. You must accept this agreement to install this software.
MICROSOFT CORPORATION END-USER LICENSE AGREEMENT
Microsoft Data Access Components 2.8
IMPORTANT-READ CAREFULLY: This End-User License Agreement ("EULA") is a legal agreement between you (either an individual or a single entity) and Microsoft Corporation for the Microsoft software product identified above, which includes computer software and may include associated media, printed
I accept all of the terms of the preceding license agreement.
< 上一步(B)
下一步(N) >
取消

4. Press “Finish” to start installation.

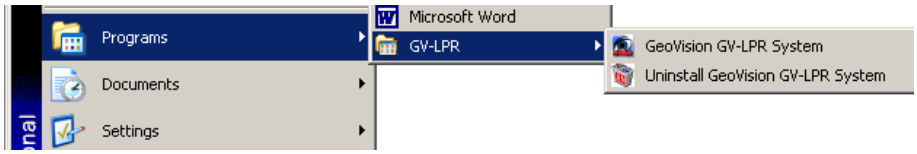


5. After complete of installation, please press “Close” to close the dialog and then restart Windows.


Microsoft Data Access Components 2.8 Setup
Setup is Complete
Setup has completed successfully.
Microsoft Data Access Components 2.8 has been successfully installed on this system.
Click Close to exit setup.
Close
Cancel

2.3 Run GV-LPR Application

1. If you have added GV-LPR to the startup of Windows, it will be run after Windows starts up. Else, run the GV-LPR application from the GV-LPR folder. You may add a short cut at the desktop if needed.

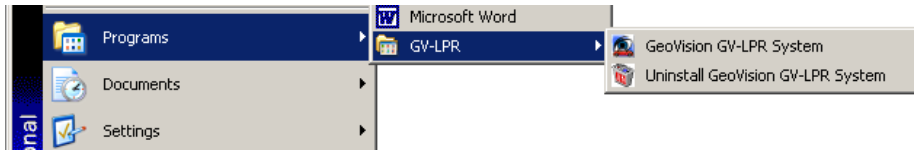


2. Be sure you have plug in the USB Key-pro mentioned in Chapter 1, or else the system cannot be run.

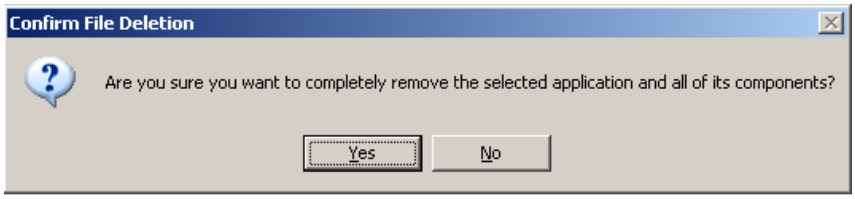
3. The first time you run the GV-LPR application, the system will ask you to setup the password of Administrator. Please setup and **DO NOT** forget the password.

2.4 Uninstall GV-LPR Application

1. Select the Uninstall icon from the GV-LPR folder to uninstall GV-LPR software.



2. The uninstaller will prompt to confirm before uninstall.


Confirm File Deletion
Are you sure you want to completely remove the selected application and all of its components?
Yes
No

3. The uninstaller will then remove all related files from your hard disk.

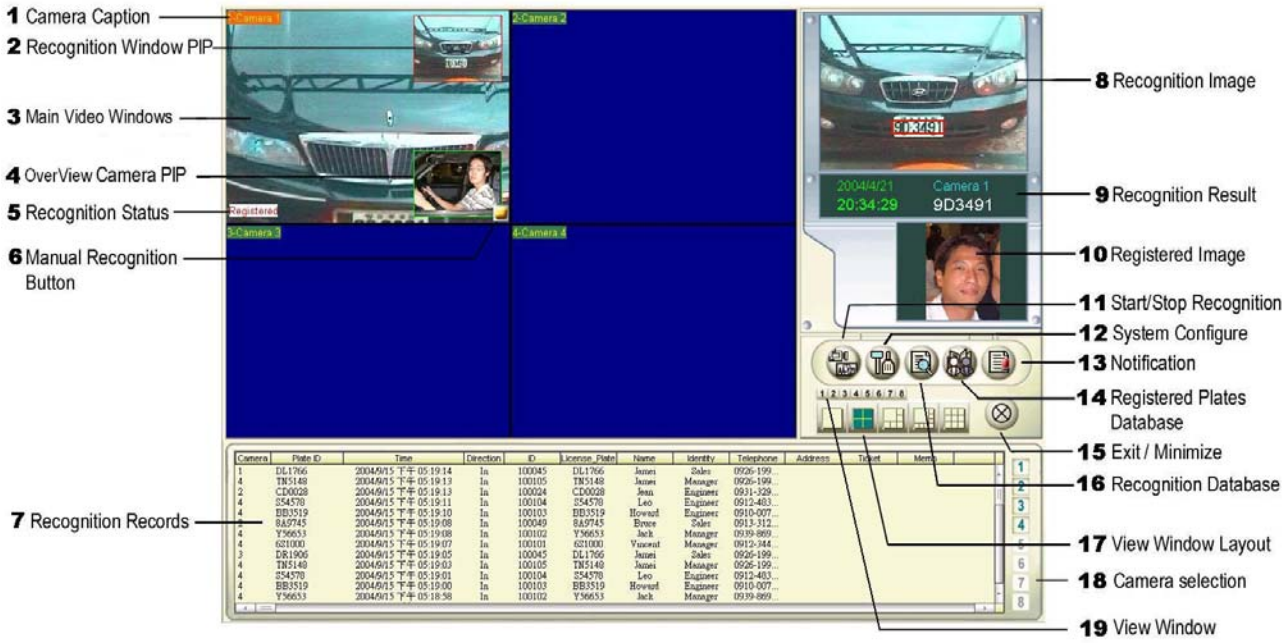
4. Images and database created by GV-LPR will not be removed.

CHAPTER 3

System Configuration

GV-LPR application is a Windows based GUI system software that is used for control, setup, and monitor the GV-LPR System. The detail functions will be explained from Chapter 3 to Chapter 6.

3.1 Main Screen Features



1. **Camera Caption**

   This caption shows the camera name and can be modified. Counter can also be shown here just after the Camera Caption if it is enabled.

2. **Recognition Window PIP**

   This is a Picture In Picture window, which is by default disabled. When enabled, by default this window shows the last recognized image. You may change it to show live video instead. Then the [Main Video Window] will be changed to show the recognized image.

3. **Main Video Window**

   This window default shows live video of the recognition camera. If [Recognition Window PIP] is enabled, it may be set to show live video or recognized image.

4. **Overview Camera PIP**

   This is a Picture In Picture window. It is default disabled. If an Overview Camera is setup for a lane, this window can be enabled to show the live video of the Overview Camera. An Overview Camera can be setup to capture the image of the driver or the overview of the car.

5. **Recognition Status**

   The status of the recognition will be shown here as Registered, Visitors or Unrecognized.

6. **Manual Recognition Button**

   This button is only been shown when [Manual Detect] recognition mode is selected. [Manual Detect] is normally been used when setting up the system, before the I/O device is ready. You may press the button to trigger the recognition.

7. **Recognition Records**

   This window shows the recent recognition records up to 5000 records. You may show the detail and image of the related record by double clicking on the record.

8. **Recognition Image**

   This window shows the last recognized image.

9. **Recognition Result**

   This window shows the date, time, camera name and the result of the last recognition.

10. Registered image

You may set the image of the drivers or the overview image of the vehicles as Registered Image. The image will be shown when the registered car is being recognized. The function can be used when the security is very concerned of.

11. Start/Stop Recognition

You may select start or stop one or more lanes of recognition.

12. System Configure

You may setup the system by System Configure. Please refer to the detail in the next section.

13. Notification

I/O and Hotkey Notification. Please refer to Chapter 6.

14. Registered Plates Database

It is used for the management of the Registered Plates Database. Please refer to Chapter 5 for the detail.

15. Version/ Exit/ Minimize

You may show the version information, select to minimize or exit the GV-LPR application.

16. Recognition Database

It is used for the management of the Recognition Database. Please refer to Chapter 4 for the detail.

17. View Window layout

You may select to show 1, 4, 6, 8 or 9 windows to monitor the live video of the lanes.

18. Camera Selection

You may select which lane or lanes to be shown in the [Recognition Records].

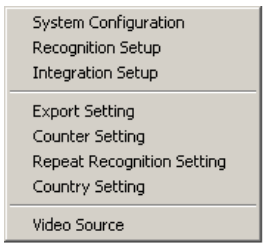
19. View Window

You may select the live video of a single lane so that you can see it clearly.

3.2 System Configure

When the first time GV-LPR is run, you will be prompted to select the country for your installation. This setting will define the recognition engine to be used. You may change the setting afterwards.

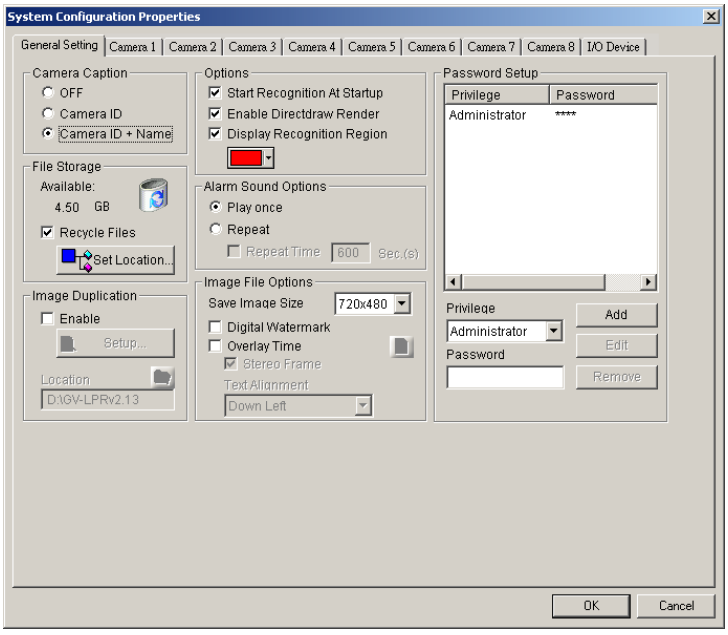
Please read the detail of System Configure before start using the GV-LPR system. There are 8 setups in the System Configure. Press the [System Configure] shows the 8 selections.



3.2.1 System Configuration

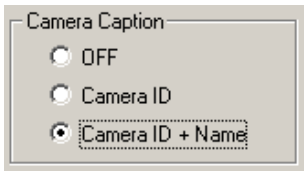
There are 3 kinds of setting: [General Setting], [Camera 1~8] and [I/O Device]:

3.2.1.1 General Setting



Camera Caption

You may set the Camera Caption, whether turn off the display by selecting [OFF], shows the [Camera ID] or shows the [Camera ID + Name] at the upper left corner of the Main Video Windows.



File Storage

[Available] displays the available free space of your hard drive. If the first drive hits 2GB then the system will automatically switch to the second hard drive for recording when there is more than one hard drive have been assigned for the File Storage.

If [Recycle Files] option is enabled then the system will start deleting the earliest image files to make space for the new image files when the system runs out of the free storage. If the [Recycle Files] option is not selected then the system will simply stop saving when there is no free storage.

Click on the [Set Location…] button and the following [Location Setup] dialog will appear. This dialog box displays the location path of your saved image files and it's available free space. You can click on the folder icon to [Add] or [Delete] location path for saving image files.

Note: When integrated with DVR, please **Do Not** set the folder of video storage path of GV-Series DVR to the same logical hard drive of GV-LPR File Storage. That will cause the GV-Series DVR to use up the hard drive.

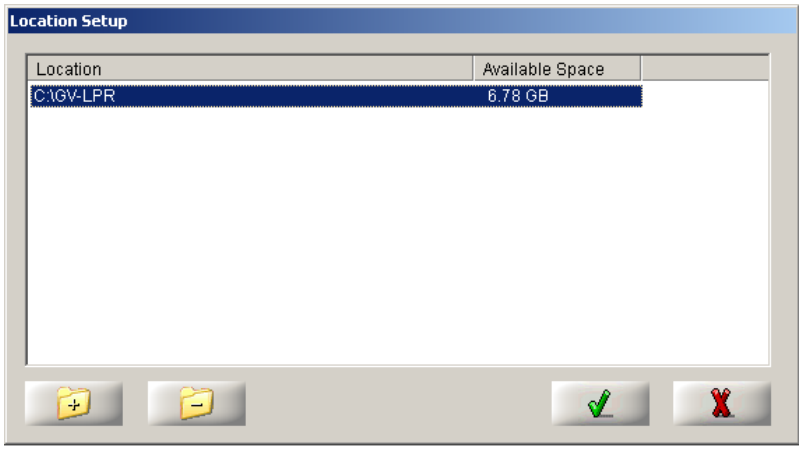
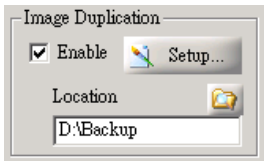
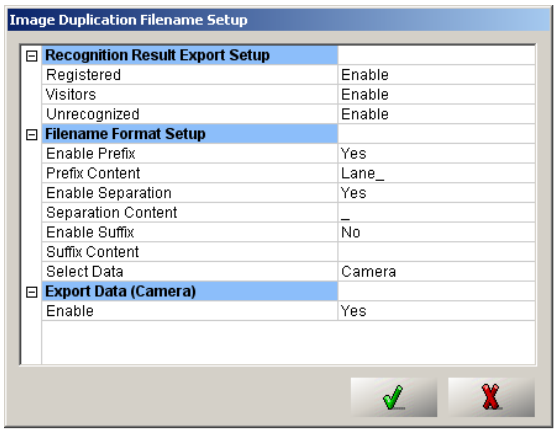


Image Duplication

If you need to duplicate the image file to other disk for backup or system integration, you may enable [Image Duplication] and set [Image Duplication Filename Setup] and [Location].





Option

It is advice to set the [Start Recognition At Startup] so that recognition starts when the application starts running. If [Display Recognition Region] is enabled, the recognized license plate region will be shown. If [Enable Directdraw Render] is enabled, better video quality can be provided by VGA card and its driver which supports Directdraw.

Note: Please disable the “Enable Directdraw Render” when you are using dual screen mode when integrated with GV-Series DVR system because VGA does not support dual screen Directdraw.

Alarm Sound Option

For the Alarm warning, it can be set to be [play once] or [Repeat].

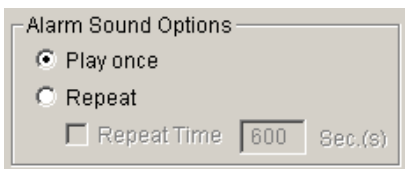
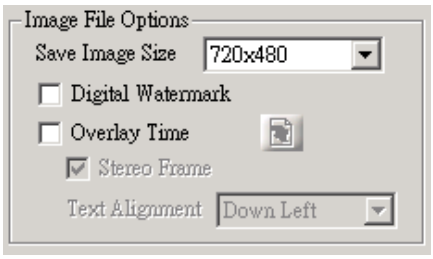


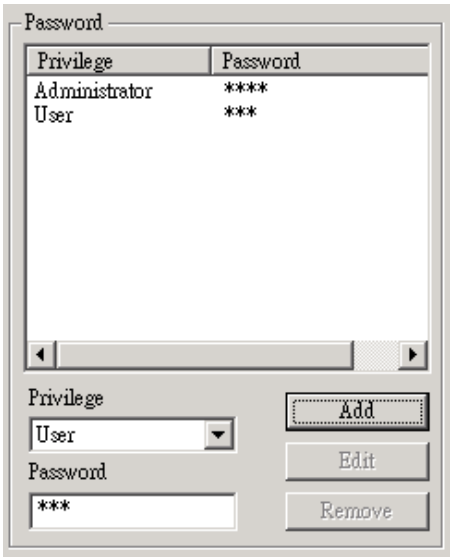
Image Options

The capture image for recognition is 720x480(NTSC) / 720x576(PAL). You may save the image with the size selected in the [Save Image Size]. [Digital Watermark] can be enabled so that the saved images could able to be proved that it has not been modified. The [Overlay Time] can write the time in the saved image file. You may set the font, whether to add [Stereo Frame] and adjust the [Text Alignment].



Password

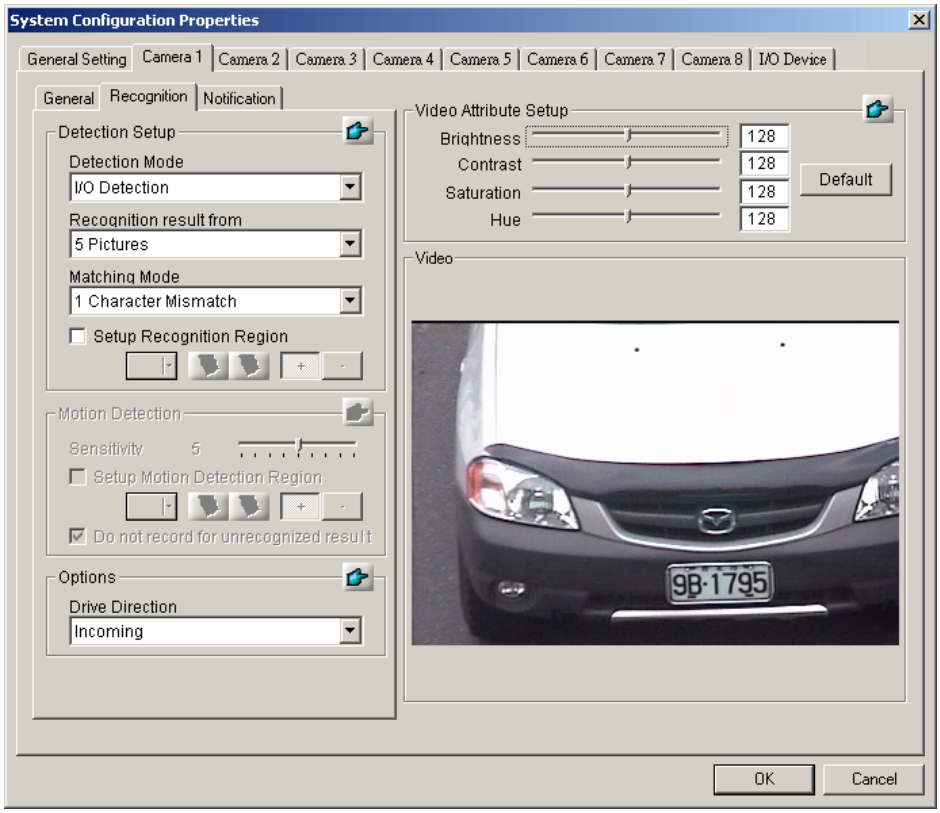
There are 3 level of privilege for Password: Administrator, Power User and User. Administrator has highest privilege with all access right. Power User and User cannot do any system configuration. User cannot add registered license plate into the system but Power User can do it. You may [Add], [Edit] or [Remove] the password.



3.2.1.2 Camera 1 ~ 8

For 8 lanes product, the dialog will show settings for Camera 1 to Camera 8. For 1 or 2 lanes product, it will only Camera 1 or Camera 1 and Camera 2 settings etc.

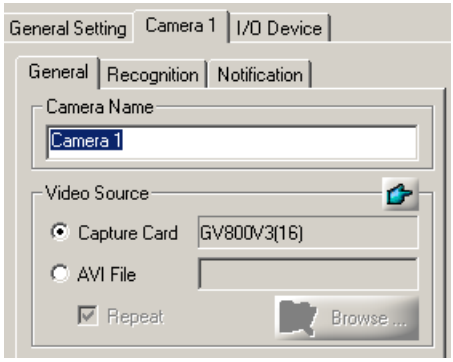
If you press this icon , the settings inside the rectangle region will be copied to all of the other cameras.



General

[Camera Name] You may set the Camera Name.

[Video Source] You may select the Video Source from Capture Card or AVI file recorded by GV-Series DVR. You may repeat playing the AVI file if needed. The resolution of video source should be 720x240, 720x480, 720x576, 720x288 or 640x480 depends on the capture card installed from GV-Series.



You may set the [Video Attribute Setup] about for the Brightness, Contrast, Saturation and Hue. When GV-LPR is integrated with GV-Series DVR system, the [Video Attribute Setup] in GV-LPR will be disabled. You may set them in the GV-Series DVR system.

Recognition

[Detection Setup]

[Detection Mode] There are [Manual Detection], [I/O Detection] and [Motion Detection] option.

[Manual Detection] is mainly used while setting up the system, testing the recognition location before setting up the I/O device. You may press the [Manual Recognition button] (please refer to page 7) in the Main Video Window to trigger the recognition.

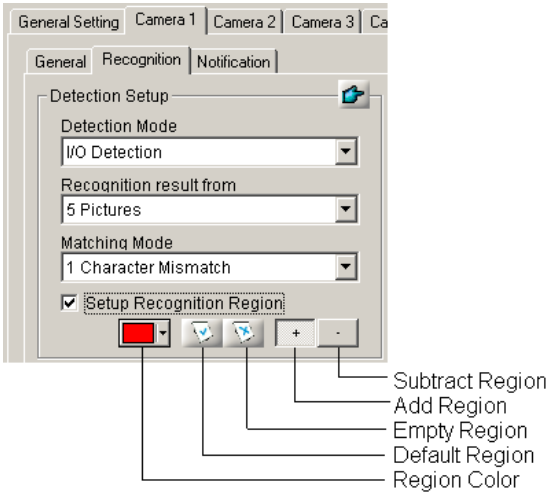
[I/O Detection] is normally used for car park or entrance.

[Motion Detection] is normally used on freeway recognition where I/O detection devices are not allowed to be installed.

[Recognition Result From] There are 1 picture, 3 pictures and 5 pictures options to be selected. It is the number of images to be captured to be recognized for each trigger. It is used for [Manual Detection] and [I/O Detection] mode. The greater value provides more accuracy, and more CPU resource is needed.

[Matching Mode] You may select the tolerance of comparison while performing matching the recognized result of the license plate with the registered database. There are 4 modes can be selected. There are All Characters Match, 1 Character Mismatch, 2 Characters Mismatch and 3 Characters Mismatch.

[Setup Recognition Region] You may add or subtract the region where the license plate is to be recognized. License plates outside this region **will not** be recognized. To add or subtract the region, please drag your mouse in the [Recognition Region Setup] area and confirm with the left button on the mouse.



[Motion Detection]

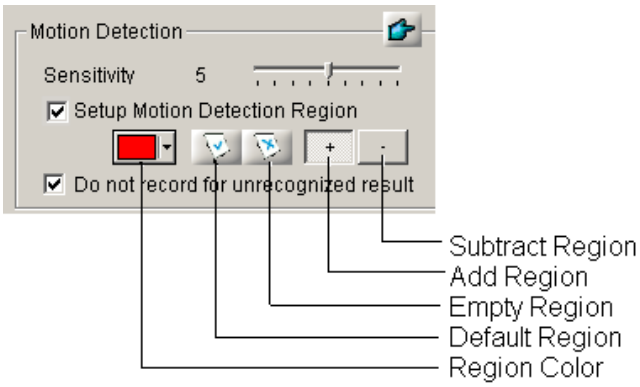
The settings in the area are only available when [Detection Mode] is selected to be [Motion Detection].

The maximum lanes supported for [Motion Detection] mode is 4 lanes.

[Sensitivity] There are 9 levels of sensitivity can be selected.

[Setup Motion Detection Region] You may add or subtract the motion sensor regions. To add or subtract the region, please drag your mouse in the [Motion Detection Region Setup] area and confirm with left button on the mouse.

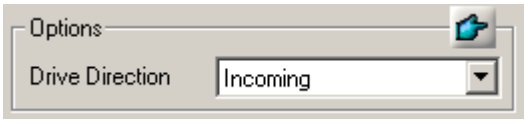
[Do not record for unrecognized result] This option is default enabled so that those recognition triggered by motion detection without license plate found can be eliminated.



When [Motion Detection] mode is used, you should be **very careful** of the installation of the camera. Make sure that the size of license plate goes in and out of the camera view are nearly the same. Do not install so that it is a small license plate far away and becomes big when it comes nearer. Please refer to images below as the guideline.

[Options]

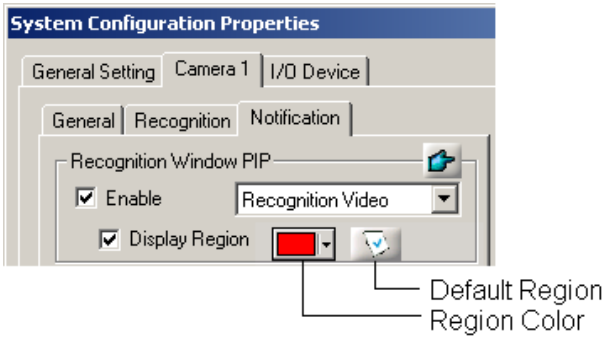
You may set the [Drive Direction] to Incoming or Outgoing.



Notification

[Recognition Window PIP]

You may enable the [Recognition Window PIP] so that the recognized image can be shown in the Picture In Picture form. By default this window shows the last recognized image. You may change it to show live video instead by changing the selection. Then the [Main Video Window] will be changed to show the recognized image.

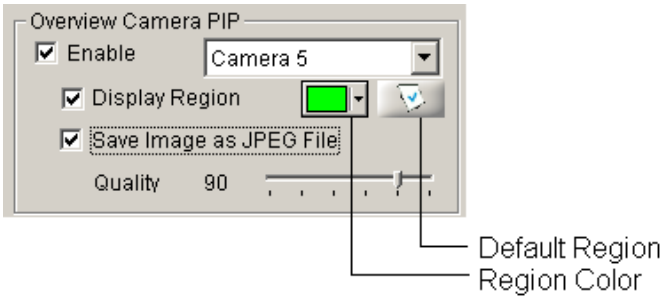


You may adjust the PIP window by enable the [Display Region] and then setup in the [Recognition Window PIP Display Region]. You may also reset it to default region by clicking the [Default Region] icon.

[Overview Camera PIP]

You may enable the [Overview Camera PIP] so that you can capture the image of the driver or the overview of the vehicle by installing another camera and shown in the Picture In Picture window. The image will be saved accompanied with the recognition image if you enable [Save Image as JPEG File]. You will see 2 images

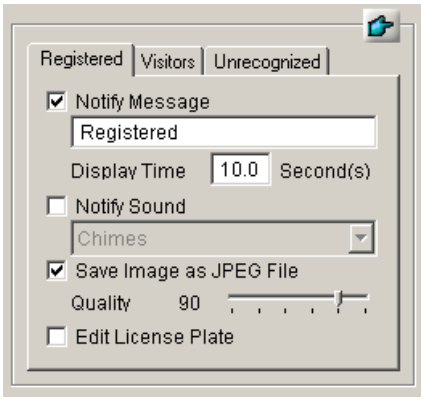
when you are querying the Recognition Record Database. You may set the image file compression quality in the [Quality]. Higher quality images require more storage spaces.



You may adjust the PIP window by enable the [Display Region] and then setup in the [Overview Camera PIP Display Region]. You may also reset it to default region by clicking the [Default Region] icon.

[Notification]

It is used to setup the notify output for the recognition. The selected options will be performed for Registered, Visitors or Unrecognized result.



[Notify Message]: The input text will be shown on the Monitoring Window.

[Display Time]: Set the time of showing the Notify Message.

[Notify Sound]: Play the selected sound file if it is enabled. It is suggested that this is enabled for the Visitor and Unrecognizable so that the guards can be warned to take care of the event.

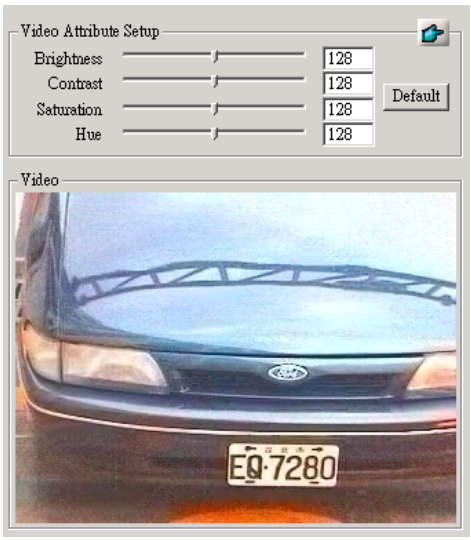
[Save Image as JPEG File]: Option whether to save the image file.

[Quality]: Higher quality images require more storage spaces.

[Edit License Plate]: Option whether to show dialog to modify license plate.

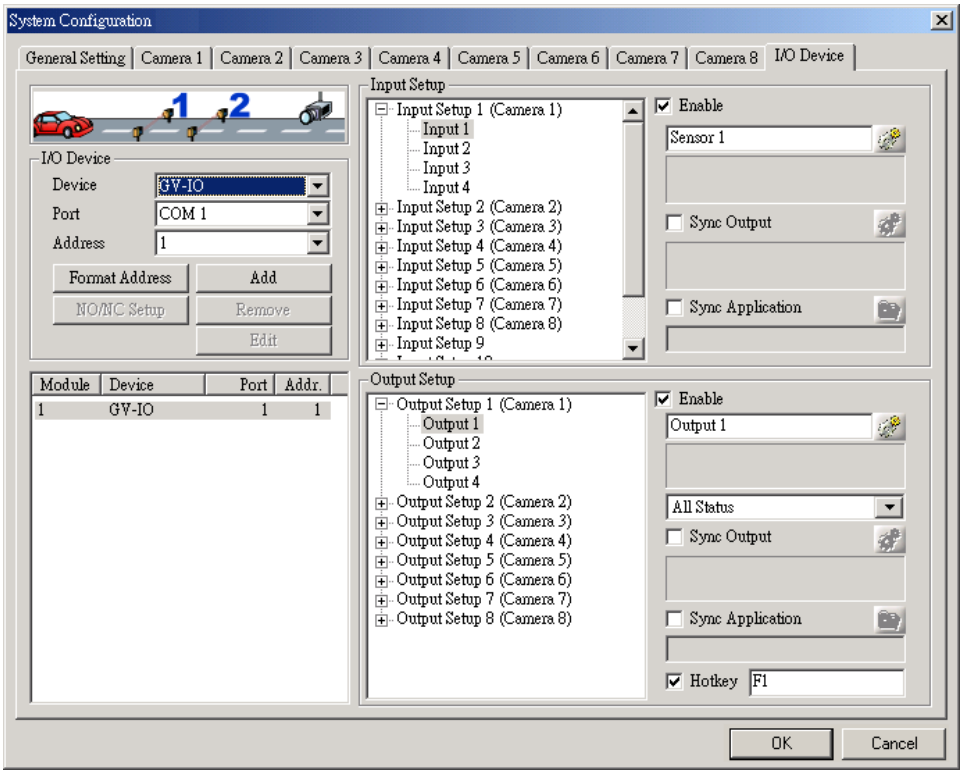
[Video Attribute Setup]

You may set the Brightness, Contrast, Saturation and Hue of the camera.



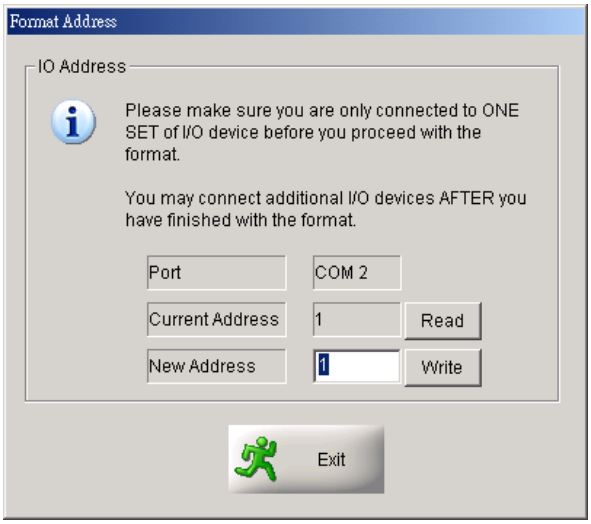
3.2.1.3 I/O Device

To use [I/O Detect] mode, you should set the [I/O Device]. Please refer to the video demonstration at the upper left corner of this dialog. It shows to 2 infrared sensors to trigger the recognition. 2 infrared sensors can prevent most of the trigger generated by people walk through. You can also adjust the distance of the 2 infrared to prevent bicycle or motorbike. Normally, it is at least 1.5 meter apart. Magnetic Loop Detector is the main sensor device to be used for I/O trigger. For Magnetic Loop Detector, 1 input is enough to trigger the system.

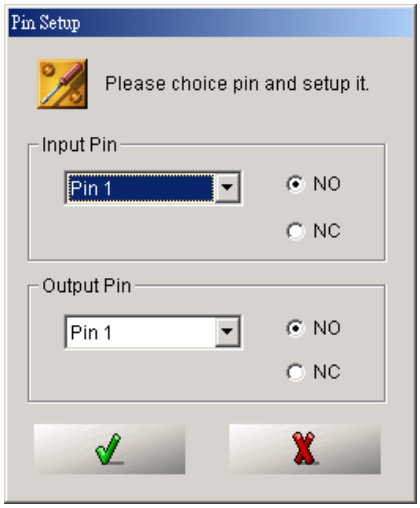


[I/O Device]

Before you can start using the I/O modules you have to setup the GV-LPR to recognize them first. You should have a GV-NET Card connected to the COM port of your computer or GV-COM module connected to the USB port of your computer. Please refer to Chapter 1. Select the device in the [Device] drop down menu, normally GV-IO, select COM port in [Port] and the module address from [Address], normally 1. Then click [Format Address] button. The [Add] button will be selectable if the system successfully found your module. Click the [Add] button and this module will appear in the list. You may remove or edit the device when you select the device and press [Remove] or [Edit] button.



After adding the I/O device, you may setup the [Pin Setup] of each pin to Normal Open or Normal Close by clicking the [NO/NC Setup] button.

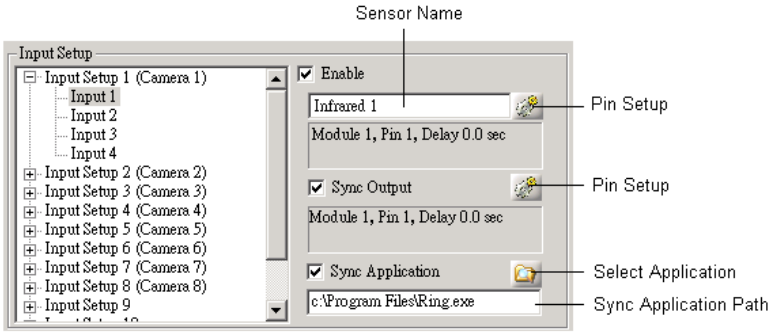


[Input Setup]

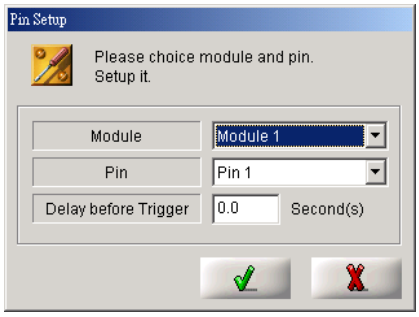
You can select the I/O device to set. Input Setup 1~8 are mainly for triggering recognition. Input Setup 9~12 can be used for auxiliary purpose if needed.

Input Setup 1 is for camera 1 and so on. There are maximum 4 inputs to trigger the recognition of a camera. If you are only going to set an input to trigger the recognition, you may just enable the input 1. If you are going to use two inputs to trigger the recognition, you should enable both input 1 and input 2, etc. When you set Input 1 and Input 2 it means that it will trigger recognition only when input 1 is triggered and then input 2 is also triggered before the trigger of input 1 is off. It will not trigger recognition when input 2 is triggered and then input 1 is also triggered. This can help when concerning with the drive direction.

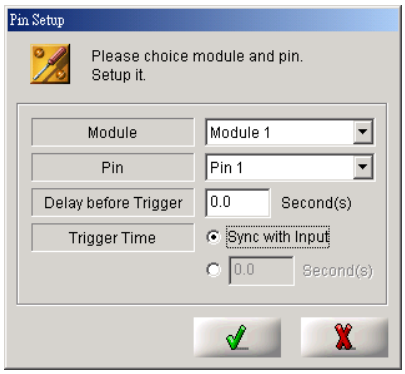
[Sensor Name] You may set the name of the sensor in the [Sensor Name].



[Pin Setup] Be remember to set the [Pin Setup] for the Input by pressing the [Pin Setup] button. You should set the I/O [Module] number and [Pin] number. You may set the [Delay before Trigger] of recognition if needed.



[Sync Output] If you need to synchronize an output to an input, for example switch on a light when the first infrared is triggered, you may enable the [Sync Output] and set the [Pin Setup] for it. You may set the [Delay before Trigger] if needed. The [Trigger Time] can be synchronized with the input or user defined.



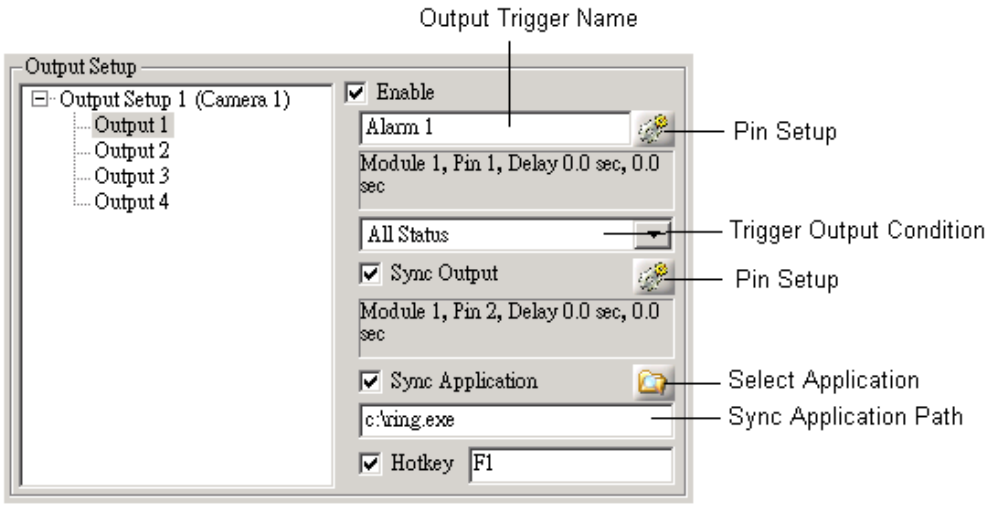
[Sync Application] You may enable it so that a program can be synchronized to run for integration.

[Select Application] You may select the Synchronized Application Path by clicking this button.

[Sync Application Path] The selected Sync Application Path will be shown.

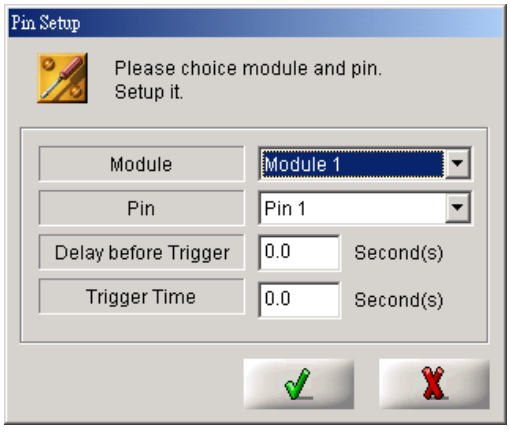
[Output Setup]

There are maximum 8 outputs can be set according to the result of the recognition. Output Setup 1~8 are mainly for output triggering by recognition result. Other programs can be synchronized to run for integration. Hot Key can be set to trigger the outputs.



[Output Trigger Name] You may set a meaningful name to identify the trigger, for example “Gate” or “ Light”.

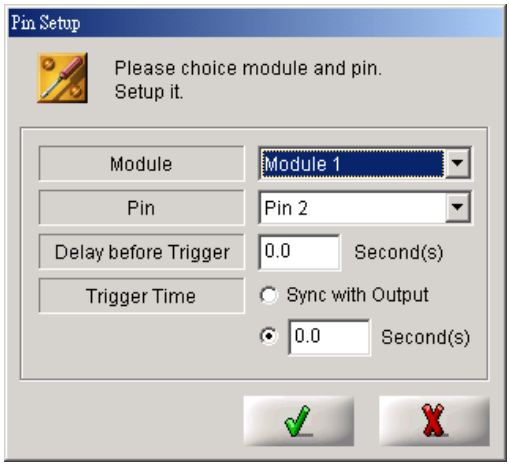
[Pin Setup] Be remember to set the [Pin Setup] for the Output by pressing the [Pin Setup] button. You should set the Output [Module] number and [Pin] number. You may set the [Delay before Trigger] and [Trigger Time] if needed.



[Trigger Output Condition] You should select what kind of recognition result to trigger the output. A “Registered” result may trigger to open the gate. A “Visitors” or “Unrecognized” result may trigger an alarm if needed.

[Sync Output] If you need to synchronize an output to an input, like switch on a light when the first infrared is triggered, you may enable the [Sync Output] and set the [Pin Setup] for it. You may set the

[Delay before Trigger] if needed. The [Trigger Time] can be synchronized with the input or user defined.



[Sync Application] You may enable it so that a program can be synchronized to run for integration.

[Select Application] You may select the Synchronized Application Path by clicking this button.

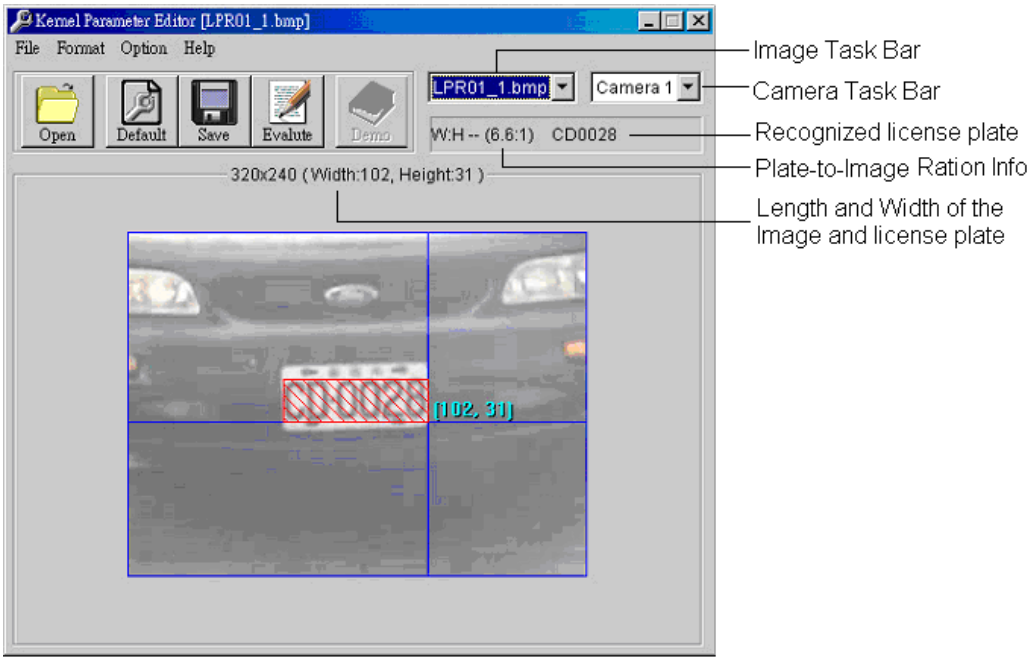
[Sync Application Path] The selected Sync Application Path will be shown.

[Hot Key] You may set the Hot Key so that when pressing the Hot Key, the output will be triggered. The Hot Key can be F1 ~ F8, Ctrl + (A~Z) or Ctrl + (0_9).

3.2.2 Recognition Setup

The system has a default value for the license plate parameters. You may choose not to use this setup function if your found the default setting is suitable for your environment installation.

The Recognition Setup lets GV-LPR recognition kernel to know the normal size of the license plates. First select the camera to conduct the recognition setup on, then select a previously captured image by using the Image Task Bar, or use the [Open] button to choose an image to conduct the recognition setup on. Make sure to hit [Save] after conducting the recognition setup.



Function Panel

[Open] Use it to open BMP or JPEG files

[Default] Use it to return to default setting

[Save] Use it to save the current setting

[Evaluate] Use it to recognize the license plate inside the image

[Image Task Bar] It lists out captured images using manual detection.

[Camera Task Bar] It lists out the cameras for conducting the recognition setup.

[Plate-to-Image Ratio Info] This information shows the best license plate-to-image ratio for recognition.

[Length & Width of the image & the plate] The length and width of the image file (The length and width of the license plate)

[Length & Width of the plate] The length and width of the license plate.

5 Easy Steps For The Setup：

Step 1.

First, select the camera to conduct the recognition setup on.

Step 2.

Then select a previously captured image by using the Image Task Bar, or use the [Open] button to choose an image to conduct the recognition setup on.

Step 3.

Point your mouse arrow sign to the upper left-hand corner of the license plate, left click and hold on to the click, then drag the arrow to the lower right-hand corner of the license plate, and release the left click.

Step 4.

Hit [Save] to save the current setting.

Step 5.

Hit [Evalute] to see if the characters of the license plate can be recognized. Repeat Step 3 and 4 if the recognition failed.

3.2.3 Integration

GV-LPR can be integrated with GV-Series Digital Surveillance System (Version 8.0 or higher) by using the same capture card on a same PC. You may install 2 monitors, with the main monitor showing GV-Series user interface and the second monitor showing GV-LPR user interface. The main purpose for the integration is that it could lower the installation cost and provides leading function of retrieving video by license plate number.

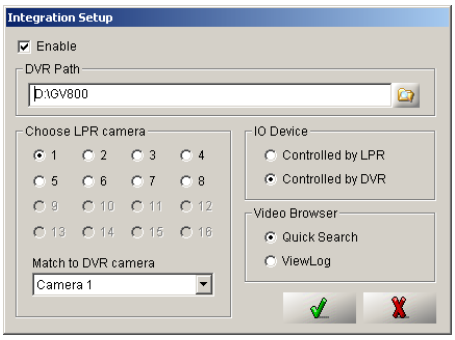
Retrieving video by using license plate number provides a very key feature for the integration of GV-LPR with GV-Series Digital Surveillance System. You may view video of any or all of the cameras before or after the vehicles being recognized. That means you can easily retrieve the video of suspicious drivers or their passengers about what they have brought into or out of the building or other behaviors.

Note: Please Do Not set the folder of video storage path of GV-Series DVR to the same logical hard drive of GV-LPR File Storage. That will cause the GV-Series DVR to use up the hard drive.

Run the GV-Series DVR before GV-LPR. It shares the Video and I/O to GV-LPR.

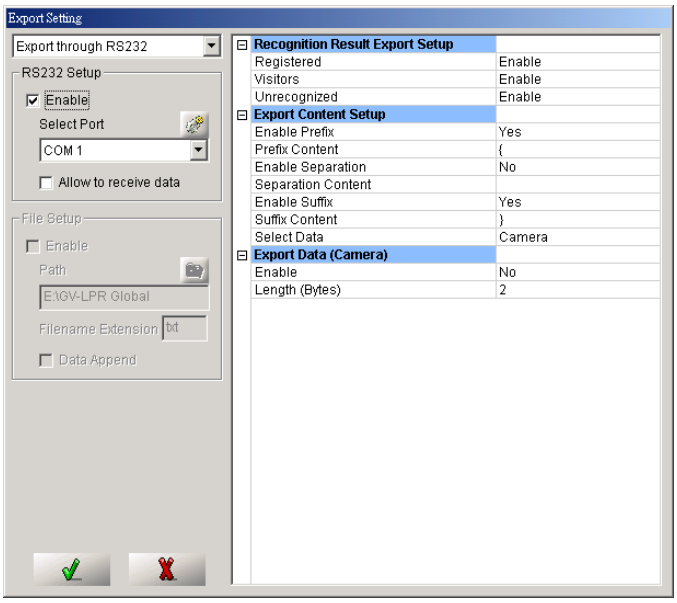
For the setup of the integration, please follow these steps:

1. Select the [Enable] option.
2. Select correct installed path of the GV-Series for [DVR Path].
3. Match the camera of GV-LPR to DVR by the selection in [Choose LPR Camera] and [Match to DVR camera]. This function let you to select which camera of GV-Series DVR to share to the GV-LPR for recognition.
4. If I/O device is used for GV-LPR, please choose whether it is controlled by GV-LPR or controlled by DVR by selecting [Controlled by LPR] or [Controlled by DVR] in [IO Device]. If DVR does not use the I/O device, it is better to set it to [Controlled by LPR].
5. Please choose in the [Video Browser] whether to use [Quick Search] or [ViewLog] of GV-Series DVR when searching function is selected. [Quick Search] provides single channel playback while [ViewLog] provides all cameras playback with more functions.



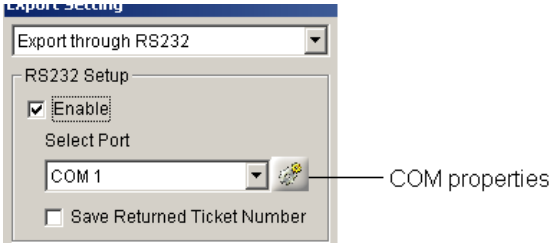
3.2.4 Export Setup

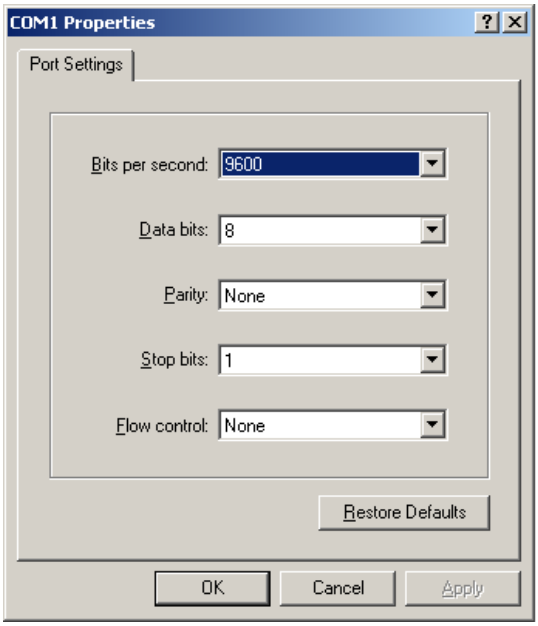
Export Setup enable you to output the recognition result for system integration. There are 2 ways to export the result. You may select [Export by RS232] or [Export to File].



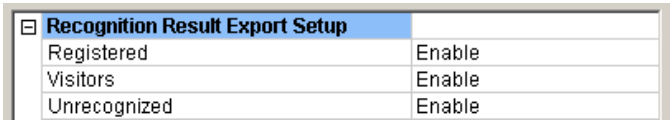
[Export by RS232]

You should first select the [Export through RS232] export selection. Then, enable the [Enable] in [RS232 Setup] and select the COM port and set the communication properties of the COM port by pressing the [COM Properties] button. [Save Returned Ticket Number] can be used when integration with Ticketing System. The Ticketing System should send the received data and add the Ticket Number, [Card ID] in the last field and send back to GV-LPR. The [Card ID] will be received and can be used to search for the recognition record.



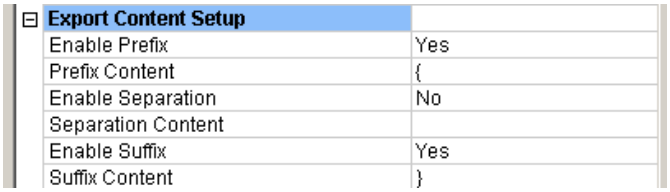


You may select all recognition result to export or just some of the condition, for example just Registered and Visitors. Unrecognizable license plates are outputted as ******.



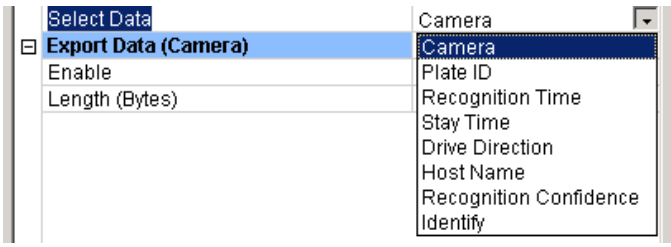
Recognition Result Export Setup	
Registered	Enable
Visitors	Enable
Unrecognized	Enable

You may enable the Prefix, Separation between Data, and Suffix if needed.



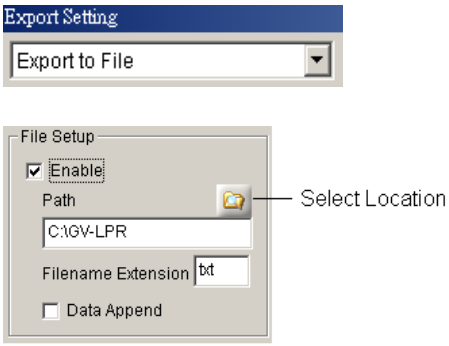
Export Content Setup	
Enable Prefix	Yes
Prefix Content	{
Enable Separation	No
Separation Content	
Enable Suffix	Yes
Suffix Content	}

Please notice the content of the Data Select. You may output not only the license plate number [License Plate] but also [Camera], [Recognition time], [Stay time], [Drive Direction], [Host Name], [Recognition Confidence] and [Identify]. [Identify] equal to 0 means that is a [Registered], equal to 1 means [Visitors], and 2 means [Unrecognized]. They could be separated by [Separation Content] mentioned above. You have to enable the [Enable] option and set the [Length (Bytes)] for the Data you are going to export.

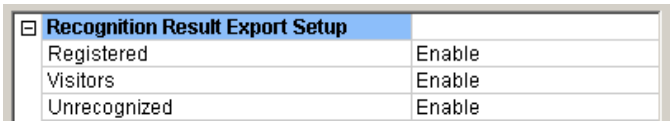


[Export to File]

You should first select the [Export to File] export selection. Then, enable the [Enable] in [File Setup], set the [Path] by using the [Select Location] button or manually input the path. Set the [Filename Extension] and whether the file is to be appended in the [Data Append].



You may select all recognition result to export or just some of the condition, for example just Registered and Visitors. Unrecognizable license plates are outputted as ******.

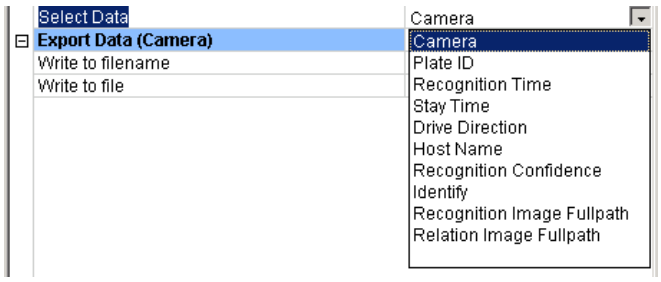


Recognition Result Export Setup	
Registered	Enable
Visitors	Enable
Unrecognized	Enable

You may enable the Prefix, Separation between Data, and Suffix if needed. They take effect in the filename and data of the exported file.

Filename Format Setup	
Enable Prefix	Yes
Prefix Content	EVENT_
Enable Separation	Yes
Separation Content	_
Enable Suffix	No
Suffix Content	

Please notice the content of the Data Select. You may output not only the license plate number [License Plate] but also [Camera], [Recognition time], [Stay time], [Drive Direction], [Host Name], [Recognition Confidence], [Identify],[Recognition Image Fullpath] and [Relation Image Fullpath]. [Identify] equal to 0 means that is a [Registered], equal to 1 means [Visitors], and 2 means [Unrecognized]. They could be separated by [Separation Content] mentioned above.



If you want the Data to be in the filename, set the [Enable] to [Yes]. If you want the Data to be written to the exported file, set [Write to file] to [Yes]

Example: If you are going export [License Plate] data and the filename is [Camera], then you may select as:

Select Data	Camera
Export Data (Camera)	
Enable	Yes
Write to file	No

and

Select Data	License Plate
Export Data (License Plate)	
Enable	No
Write to file	Yes

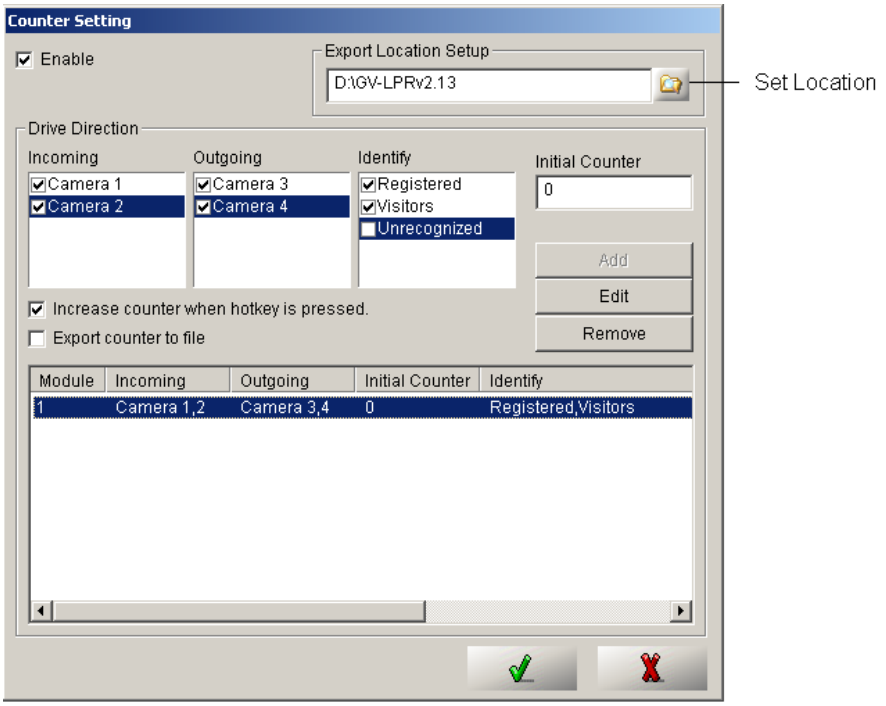
Then you may have a file named “EVENT_1.txt” generated with content of “AB1234” when a vehicle with license plate number “AB1234” is recognized by the camera 1. If the [Data Append] is not enabled, the content of the file will be just a new line of data of the last recognition. If it is enabled, a new line of data will be appended to the last line of the file for each recognition.

For the [Select Data] of [Recognition Time], you may set the option of each unit in detail.

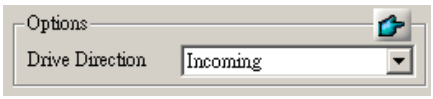
Select Data	Recognition Time
Export Data (Recognition Time)	
Enable	No
Year	Yes
Month	Yes
Day	Yes
Hour	Yes
Minute	Yes
Second	Yes
MiniSecond	Yes
Write to file	No
DateTime Format	20041121212603406
Year	Yes
Month	Yes
Day	Yes
Hour	Yes
Minute	Yes
Second	Yes
MiniSecond	Yes

3.2.5 Counter Setting

You may use the counter to count the traffic flow or count the remaining empty unit of parking lots. The result can be shown on the Camera Caption and optionally output to file.



1. First, enable the [Enable] option. Then select the camera from [Incoming] and/or [Outgoing]. The [Drive Direction] of each camera decides whether it is placed in [Incoming] or [Outgoing]. [Incoming] increases the counter and [Outgoing] decreases the counter. More than one camera can be set for a group of count.



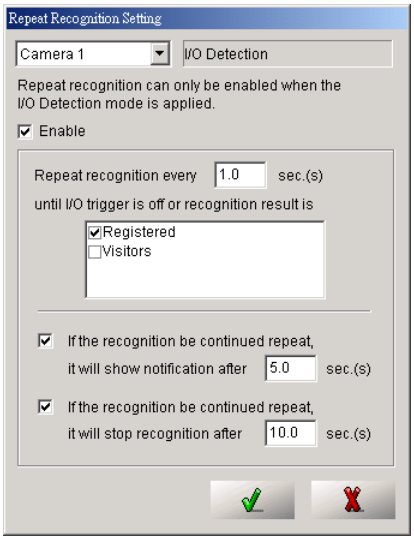
2. Select the [Identity] to count.
3. Set the [Initial Counter].
4. Select whether to enable [Increase counter when hotkey is pressed].
5. Select whether to enable [Export counter to file].
6. Press the [Add] button to add a new counter. Press [Edit] after you have modify the settings of a counter.

You may manually input the path of [Export location Setup] or by pressing the [Set Location] button.

If you are going to count the remaining unit of parking lot, you may set the [Initial Counter] to current empty unit and reverse the option of [Incoming] and [Outgoing] option of the camera so that increase or decrease function is correct.

3.2.6 Repeat Recognition Setting

Repeat Recognition can only be enabled when the [I/O Detection] mode is applied. The system will repeat recognition until the vehicle leaves the I/O sensor or the recognition result is “Registered” or at least “Visitors”. This function will increase the recognition rate. For the system used for a car park for registered car, it is suggested to set to “Registered”. For the non-registered usage like public car park, it is proposed to set to “Registered” plus “Visitors”.

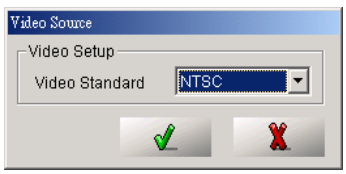

Repeat Recognition Setting
Camera 1
I/O Detection
Repeat recognition can only be enabled when the I/O Detection mode is applied.
Enable
Repeat recognition every 1.0 sec.(s)
until I/O trigger is off or recognition result is
Registered
Visitors
If the recognition be continued repeat, it will show notification after 5.0 sec.(s)
If the recognition be continued repeat, it will stop recognition after 10.0 sec.(s)

3.2.7 Country Setting

You have to select the country or region where you are installing the GV-LPR. The recognition engine for different country is different. Please make sure you have selected the correct country or region.

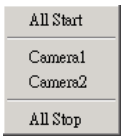
3.2.8 Video Source

You may select the video standard to be NTSC or PAL here.



3.3 Start/Stop Recognition

Press [Start/Stop Recognition] icon to start or stop recognition. You may select start or stop one or more cameras of recognition.



3.4 Version/Exit/Minimize

Use the [Version/Exit/Minimize] icon to show the version, select to exit or minimize the program.

CHAPTER

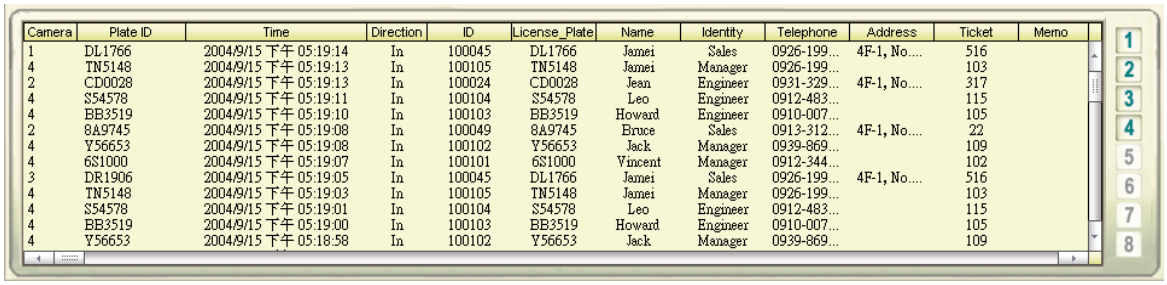
4

Recognition Database

You can use [Recognition Records] or [Recognition Database] to view the recognition records. The database records the image, camera, recognized license plate number, time, direction etc. A hard drive of 80G can record about 1 millions records of data.

4.1 Recognition Records

You may view the latest recognition records from the [Recognition Records]. The number button at the right hand side is the switch for you to select the records from which cameras are to be shown.



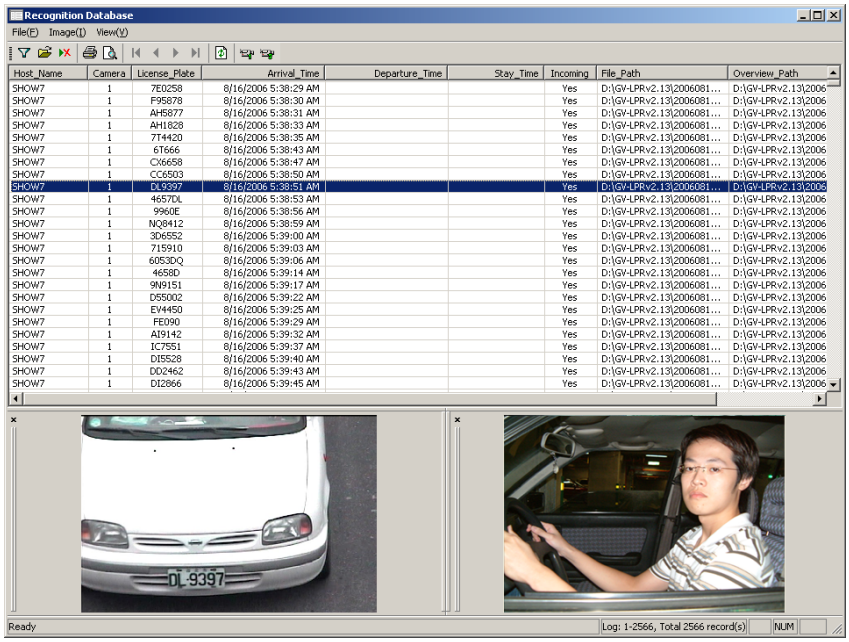
Camera	Plate ID	Time	Direction	ID	License_Plate	Name	Identity	Telephone	Address	Ticket	Memo
1	DL1766	2004/9/15 下午 05:19:14	In	100045	DL1766	Jamei	Sales	0926-199...	4F-1, No....	516	
4	TN5148	2004/9/15 下午 05:19:13	In	100105	TN5148	Jamei	Manager	0926-199...		103	
2	CD0028	2004/9/15 下午 05:19:13	In	100024	CD0028	Jean	Engineer	0931-329...	4F-1, No....	317	
4	S54578	2004/9/15 下午 05:19:11	In	100104	S54578	Leo	Engineer	0912-483...		115	
4	BB3519	2004/9/15 下午 05:19:10	In	100103	BB3519	Howard	Engineer	0910-007...		105	
2	8A9745	2004/9/15 下午 05:19:08	In	100049	8A9745	Bruce	Sales	0913-312...	4F-1, No....	22	
4	Y56653	2004/9/15 下午 05:19:08	In	100102	Y56653	Jack	Manager	0939-869...		109	
4	6S1000	2004/9/15 下午 05:19:07	In	100101	6S1000	Vincent	Manager	0912-344...		102	
3	DR1906	2004/9/15 下午 05:19:05	In	100045	DL1766	Jamei	Sales	0926-199...	4F-1, No....	516	
4	TN5148	2004/9/15 下午 05:19:03	In	100105	TN5148	Jamei	Manager	0926-199...		103	
4	S54578	2004/9/15 下午 05:19:01	In	100104	S54578	Leo	Engineer	0912-483...		115	
4	BB3519	2004/9/15 下午 05:19:00	In	100103	BB3519	Howard	Engineer	0910-007...		105	
4	Y56653	2004/9/15 下午 05:18:58	In	100102	Y56653	Jack	Manager	0939-869...		109	

1 2 3 4 5 6 7 8

Double click any of the records will show the [Event View]. You can get more information from the [Event View], for example the image of the vehicle or image of the driver. You may press the [Set Image as Registered Image] so that when next time the vehicle is recognized, the registered vehicle image is shown.

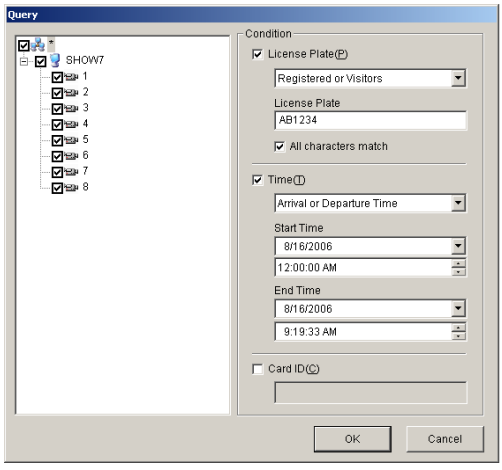
4.2 Recognition Database

You may press [Recognition Database] icon to view the recognition records. [Recognition Database] provides functions of Query, Open Database, Delete Record, Print and Print Preview. Records being queried will be shown with detail items and license plate image plus relation image if Overview Camera has been setup.


Recognition Database
File(F) Image(I) View(V)
Host_Name Camera License_Plate Arrival_Time Departure_Time Stay_Time Incoming File_Path Overview_Path
SHOW7 1 DL9397 8/16/2006 5:38:51 AM Yes
Ready
Log: 1-2566, Total 2566 record(s)
NUM

4.2.1 Query

You may query the records by selecting the [Camera], [License Plate] and the recognize result status. License plate number can be search in [All Characters Match] mode or partially match. [All Characters Match] mode is faster. There are also options of [Arrival_time] or [Departure_time] to be selected. [Start Time] and [End Time] are also adjustable. [Card ID] can also be search for if it is integrated with ticketing system.

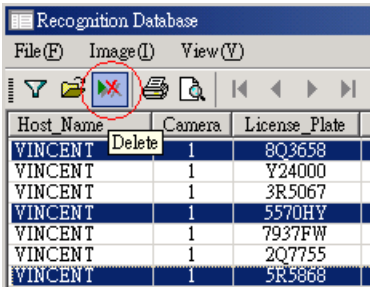


4.2.2 Open Recognition Database

You may open a previously exported Recognition Database to Query, Delete Record or Print.

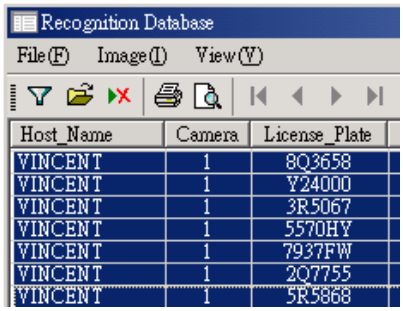
4.2.3 Delete Recognition Records

Select the records to be deleted and press the Delete button.

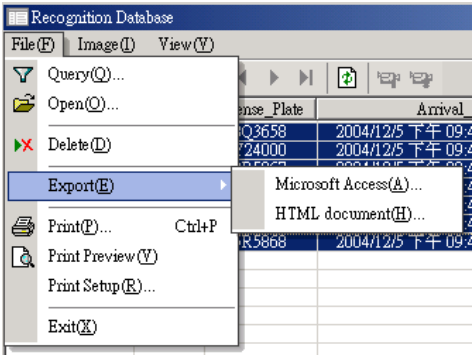


4.2.4 Export Recognition Records

1. Select the records to be exported.



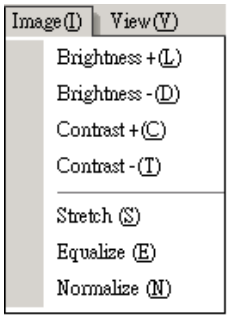
2. Select to export to [Microsoft Access] format or [HTML document] format.



3. Select the path and input the filename to export.

4.2.5 Image Adjustment

The Image can be adjusted for Brightness, Contrast, Stretch, Equalize and Normalize.



4.2.6 View Recognition Video (to be used with DVR integration)

You may press button to launch [Quick Search] or [ViewLog] of GV-Series DVR to watch the video recorded when the vehicles enter the recognition region. Features of [Quick Search] are listed below. For features of [ViewLog], please refer to the user manual of GV-Series DVR.

No.	Name	Description
1	Monitoring Window	Displays video associated to the event
2	Mode Switch	Click these buttons to enable or disable Transaction Window and to switch between 640x480 or 320x240 display.
3	ViewLog	Click to open ViewLog application.
4	Time Period	Use these buttons to search event within the specified time.
5	Playback Panel	Includes Play, Pause, Previous 10 frames, Home, Next 10 frames, End buttons.
6	Exit	Click to close Quick Search screen

4.2.7 View Related Video (to be used with DVR integration)

You may press button to launch [Quick Search] or [ViewLog] of GV-Series DVR to watch the video recorded by the Overview Camera when the vehicles enter the recognition region.

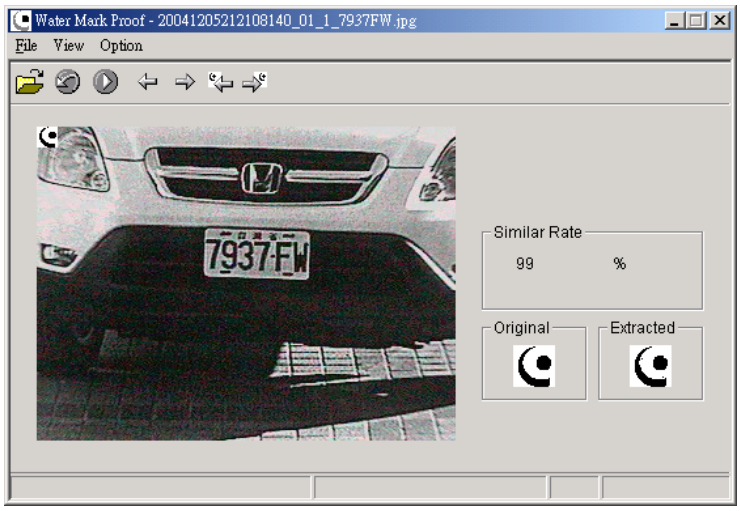
4.3 Watermark Proof

GV-LPR system offers a highly secure solution to protect digital images and video against unauthorized alteration or manipulation. To add watermark to recorded images, please refer to Chapter 3. This allows all recorded images be marked with permanent and inseparable image. Since the watermark is invisible to the naked eye, in order to see it the video stream must be open in a watermarking verification program. The Water Mark Proof program is able to verify video and image. In GV-LPR, we only use its image verification function.

1. To run the verification process, please press [Recognition Database] and select “Watermark Proof”

2. Select the file to be verified.

3. The verification result will be show as below:



Following table explains functions of each icon:

	Name	Description
	Open File	Click and select a video or image file to verify.
	First Frame	Go the first frame of the file. (Only for Video file)
	Play	Play the file. (Only for Video file)
	Previous Frame	Go to the previous frame of the file. (Only for Video file)
	Next Frame	Go to the next frame of the file. (Only for Video file)
	Previous Watermarked Frame	Go to the previous frame that contains watermark. (Only for Video file)
	Next Watermarked Frame	Go to the next frame that contains watermark. (Only for Video file)

The Watermark Proof displays the verifying result as follows:

Similar rate: If the image has not been tampered with, the Check sum displays a rate over 90%. Otherwise a rate lower then 90% will be treated as tampered.

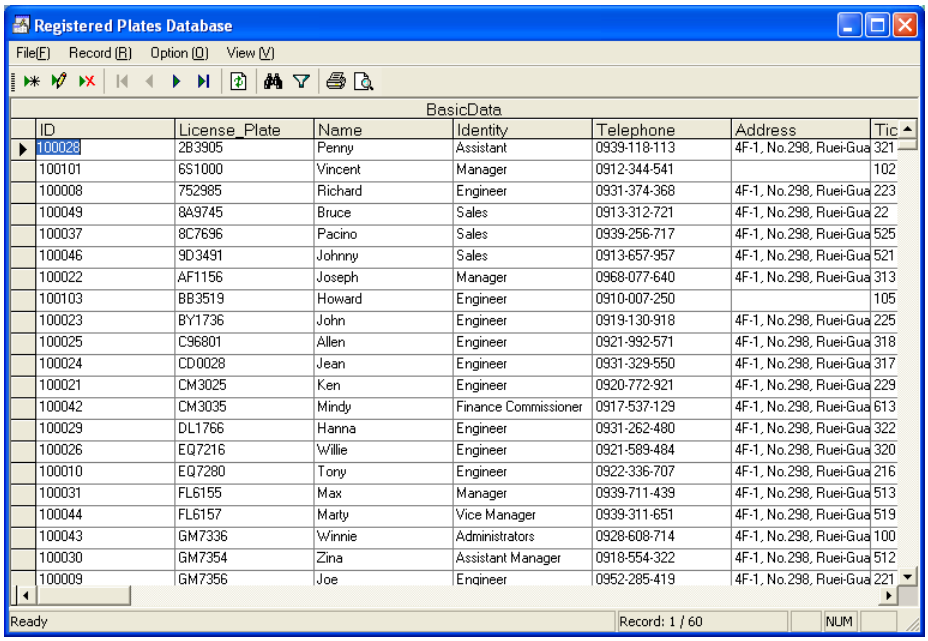
Original vs. Extracted: The Extracted section should have the same icon displayed as the one in the Original section. If not it indicates the image may have been altered.

CHAPTER 5

Registered Plates Database

Registered Plates Database is designed for the matching of the recognition result. Match to open the gate or match to warn the police is a common application.

By clicking [Registered Plates Database] icon, you may add new, edit, query, delete or print the records of the registered vehicles. The records include ID, License Plate, Name, Identity, Ticket, Telephone number, Address, Memo, the image of the vehicle owner or the overview of the vehicle. The image will be shown when the vehicle is recognized.



ID	License_Plate	Name	Identity	Telephone	Address	Tic
100028	2B3905	Penny	Assistant	0939-118-113	4F-1, No.298, Ruei-Gua	321
100101	6S1000	Vincent	Manager	0912-344-541		102
100008	752985	Richard	Engineer	0931-374-368	4F-1, No.298, Ruei-Gua	223
100049	8A9745	Bruce	Sales	0913-312-721	4F-1, No.298, Ruei-Gua	22
100037	8C7696	Pacino	Sales	0939-256-717	4F-1, No.298, Ruei-Gua	525
100046	9D3491	Johnny	Sales	0913-657-957	4F-1, No.298, Ruei-Gua	521
100022	AF1156	Joseph	Manager	0968-077-640	4F-1, No.298, Ruei-Gua	313
100103	BB3519	Howard	Engineer	0910-007-250		105
100023	BY1736	John	Engineer	0919-130-918	4F-1, No.298, Ruei-Gua	225
100025	C96801	Allen	Engineer	0921-992-571	4F-1, No.298, Ruei-Gua	318
100024	CD0028	Jean	Engineer	0931-329-550	4F-1, No.298, Ruei-Gua	317
100021	CM3025	Ken	Engineer	0920-772-921	4F-1, No.298, Ruei-Gua	229
100042	CM3035	Mindy	Finance Commissioner	0917-537-129	4F-1, No.298, Ruei-Gua	613
100029	DL1766	Hanna	Engineer	0931-262-480	4F-1, No.298, Ruei-Gua	322
100026	EQ7216	Willie	Engineer	0921-589-484	4F-1, No.298, Ruei-Gua	320
100010	EQ7280	Tony	Engineer	0922-336-707	4F-1, No.298, Ruei-Gua	216
100031	FL6155	Max	Manager	0939-711-439	4F-1, No.298, Ruei-Gua	513
100044	FL6157	Marty	Vice Manager	0939-311-651	4F-1, No.298, Ruei-Gua	519
100043	GM7336	Winnie	Administrators	0928-608-714	4F-1, No.298, Ruei-Gua	100
100030	GM7354	Zina	Assistant Manager	0918-554-322	4F-1, No.298, Ruei-Gua	512
100009	GM7356	Joe	Engineer	0952-285-419	4F-1, No.298, Ruei-Gua	221

5.1 Add Record

You may add a new record by pressing the icon. Then input each item of the record. You must input [License_Plate] item in the record, others are optional. You may also add the image of the owner or the overview of the vehicle for the guards to do double check. If [Activation Date] is set, it will be activated on the date. If it is not set, it will be activated when this record is added. If [Expiration Date] is set, it will be expired on the date. If it is not set, it will not be expired. The [valid camera] is used to set the valid camera for this license plate number. If for example, the vehicle is not permitted for entrance of camera 3, then for 8 lanes solution, this value should be set as “1245678”. When this vehicle is recognized by camera 3, it is identified as “Visitor”. The default value for it is valid for all cameras.

5.2 Edit Record

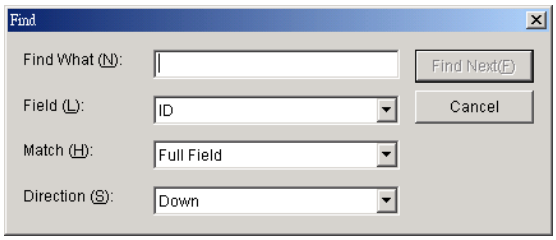
You may edit a record by selecting a record and then press the [Edit] icon.

5.3 Delete Record

You may delete a record by selecting a record and then press the [Delete] icon.

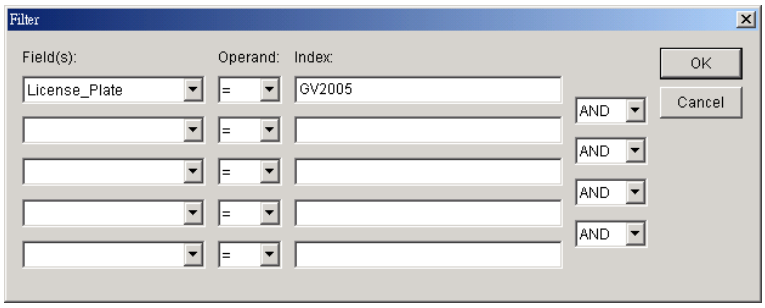
5.4 Find Record

You may find a record by pressing the [Find] icon. Select the [Field], input the text you are looking for in [Find What] and set the [Match] option and search [Direction]. Then press the [Find Next] button to find.



5.5 Filter Records

It is also a good way to use filter to filter out the records you are looking for. First, press the [Filter] icon. Then, you can set many options for each record [Field] and then use [AND] or [OR] operation. If you are going to turn off the filter, just press the filter icon again.



5.6 Go to Record

You may go to the first record by pressing icon.

You may go to the previous record by pressing icon.

You may go to the next record by pressing icon.

You may go to the last record by pressing icon.

5.7 Print

You may print the records by pressing icon.

5.8 Print Preview

You may preview before printing the records by pressing icon.

CHAPTER

6

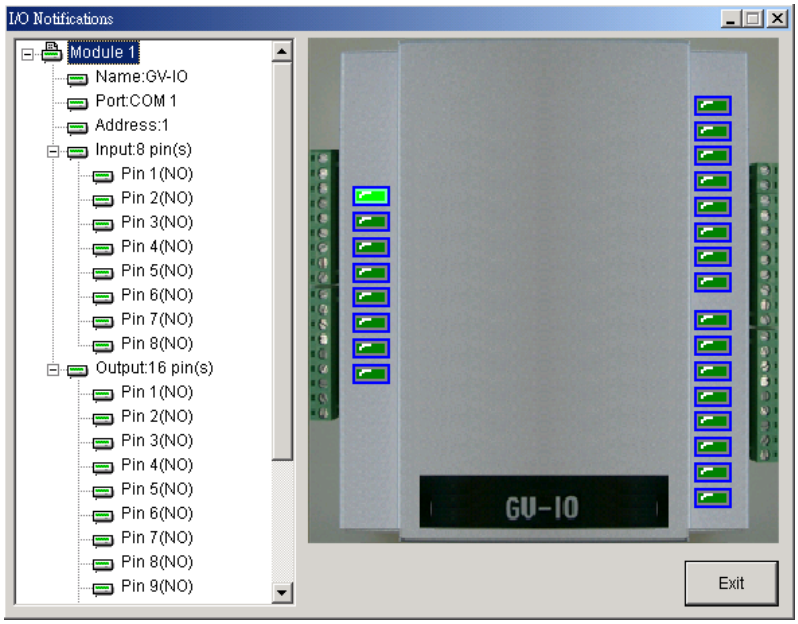
Notifications

Notification provides I/O status and the Hotkey View so that you can get the status from the system. It helps you when you are going to check the I/O devices.

6.1 I/O Notifications

Press the [Notification] icon and select

[I/O Notification]. Then you can get the current status of the I/O module. From the left of the dialog, you can get the Name, Port, Address of the I/O module and NO or NC setting of each pins. From the right of the dialog, you can get the current trigger status of the I/O pins. The example below shows that I/O input pin 1 (DI 1) is triggered.



6.2 Hotkey View

Press the [Notification] icon and select

[Hotkey View]. The left part of the dialog shows the Hotkey you have set in [Output Setup] of [I/O Device] in [System Configuration]. The right part of the dialog shows the description of the selected Hotkey.